

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Water Resource Management

SOUTHEAST DISTRICT • GROUP 2 BASIN • FEBRUARY 2003

Basin Status Report



St. Lucie and Loxahatchee



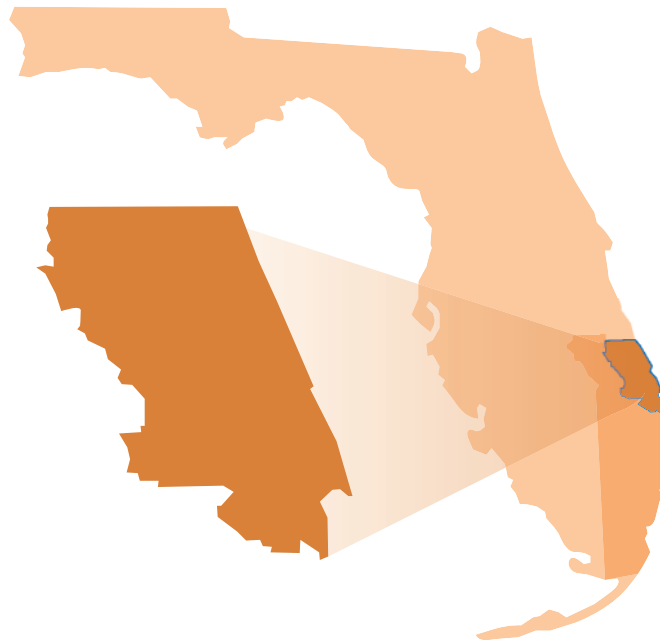


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Acknowledgments

The *St. Lucie and Loxahatchee River Basins Status Report* was prepared by the St. Lucie and Loxahatchee Basin Team of the Florida Department of Environmental Protection, as part of a five-year cycle to restore and protect Florida's water quality. Team members include the following:

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Web Sites

Florida Department of Environmental Protection, Bureau of Watershed Management

TMDL Program

<http://www.dep.state.fl.us/water/tmdl/index.htm>

Identification of Impaired Surface Waters Rule

<http://www.dep.state.fl.us/water/tmdl/docs/AmendedIWR.pdf>

STORET Program

<http://www.dep.state.fl.us/water/storet/index.htm>

2000 305(b) Report

<http://www.dep.state.fl.us/water/305b/index.htm>

Criteria for Surface Water Quality Classifications

<http://www.dep.state.fl.us/legal/legaldocuments/rules/ruleslistnum.htm>

U.S. Environmental Protection Agency's National STORET Program

<http://www.epa.gov/storet>

Preface

Content Features

- **Executive Summary:** Appears at the beginning of every report and provides an overarching view of the watershed management approach, its implementation, and how this approach will be used to identify impaired waters.
- **Chapter Summary:** Appears at the beginning of every chapter and provides an overview of the chapter.
- **Sidebar:** Appears throughout the report and provides additional information pertinent to the text on that page.
- **Noteworthy:** Appears on pages near text that needs additional information but is too lengthy to fit in a sidebar.
- **Definitions:** Appear at the side of pages where scientific terms occur that may not be familiar to all readers. The word being defined is bold-faced in the text.
- **References:** Appear at the end of Chapter 5 and provide a complete listing of all sources used within the text.
- **Appendices:** Appear at the end of each report and provide additional information on subjects, such as bioassessment methodology, rainfall and stream flow, types of natural communities, STORET stations, water quality statistics, land use, and permitted facilities.



Executive Summary

St. Lucie and Loxahatchee

The *St. Lucie and Loxahatchee River Basins Status Report* is developed in the first phase of the Florida Department of Environmental Protection's (Department) watershed approach for restoring and protecting water resources and addressing total maximum daily load (TMDL) program requirements. The watershed approach provides a framework for implementing the requirements of the 1999 Florida Watershed Restoration Act and Section 303(d) of the federal Clean Water Act.

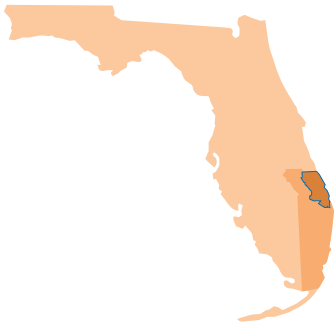
The report provides a preliminary evaluation of the status of water quality and associated ecological health in the St. Lucie and Loxahatchee River Basins. It identifies potential water quality impairments and water quality monitoring needs, and provides a summary of plans and projects underway or projected to improve water quality. The chapters of this report are described in the **Noteworthy**.

Through its watershed management activities, the Department works with regional and local interests to support programs that are improving water quality and restoring and protecting ecological resources. In the St. Lucie and Loxahatchee Basins, state, federal, regional, and local agencies and organizations are making significant progress toward identifying problems and improving water quality. The TMDL program will be closely coordinated with such efforts as the Comprehensive Everglades Restoration Program, the Indian River Lagoon Surface Water Management and Improvement Plan, the South Florida Water Quality Protection Program, and several other significant local efforts to improve water quality in these basins.

Stakeholders in these efforts share responsibilities in achieving water quality improvement objectives. Some of these stakeholders include the South Florida Water Management District (SFWMD); the U.S. Army Corps of Engineers; the Loxahatchee River Environmental Control District; the Department's Southeast District and Parks and Recreation Division; as well as local governments, concerned citizens, agricultural interests, and members of the local business community.

Total Maximum Daily Loads Program

A TMDL represents the maximum amount of a given pollutant that a waterbody can assimilate and still meet the waterbody's designated beneficial uses. A waterbody that does not meet its designated beneficial uses is defined as impaired. During the next few years, considerable data collection and analysis will be done to establish TMDLs for impaired waters in these basins and to establish initial allocations of pollutant loads needed to meet TMDLs. A watershed management plan to reduce the amount of pollutants that cause impairments will also be produced. These activities depend on the participation of the water management district, local governments, businesses, and other watershed stakeholders. The



Department will work with these groups and individuals to undertake or continue reductions in the discharge of pollutants and achieve the established TMDLs for impaired waterbodies.

This Status Report provides a preliminary identification of impaired waters in the St. Lucie and Loxahatchee Basins that may require establishment of TMDLs. The preliminary assessment, based on readily available in-house data, will be subject to revision as additional data are evaluated. The report broadly characterizes the basins' settings and their surface water and ground water resources, permitted discharges, and land uses and describes historical, current, and proposed watershed management activities. Tables in Chapter 3 and 4 include the current Planning List of potentially impaired waterbodies as well as other summary information from the preliminary assessment of water quality.

The information in this report is being used to identify waterbodies and parameters for which additional data are needed to verify water quality impairments. Data gathering and monitoring will then be focused on these potentially impaired waters. Following this, data will be reevaluated and reassessed, and in the summer of 2003 the Department will present a list of waters for which impairments have been verified and for which TMDLs will be developed. The Verified List of impaired waters will be adopted by Secretarial Order in accordance with the Florida Watershed Restoration Act. Once adopted, the list will be submitted to the U.S. Environmental Protection Agency (EPA) for approval as the state's Section 303(d) list for these basins.

Summary of Findings

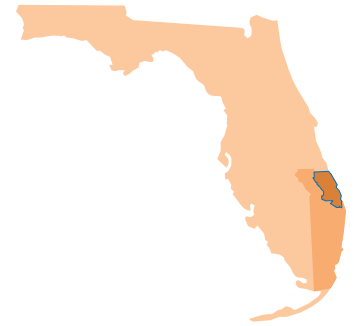
Water quality in the rivers, streams, canals, lakes, and estuaries of the St. Lucie and Loxahatchee Basins is mainly affected by agricultural practices and urbanization within the basins and possibly also by the transport of lower quality water from the adjacent Lake Okeechobee Basin. Water quality concerns in the waters of these basins identified in this evaluation are related to low levels of dissolved oxygen (DO), excessive nutrients, metals (copper and mercury), elevated levels of bacteria, and stressed biology. Salinity fluctuations due to periodically excessive discharges of fresh water and accumulations of transported sediment are also affecting the ecological integrity of the St. Lucie Estuary, in particular. Elevated salinity in the Loxahatchee River due to low flow conditions is an additional water quality concern in the Loxahatchee River Basin. Most of the data contained in this assessment are from the national **ST**Orage and **RE**Trieval (STORET) database and the DBHydro database maintained by SFWMD. The period of record for the data used in this preliminary assessment to develop the Planning List is from January 1, 1990, to December 31, 2000. The period of record for data used to produce the Verified List will include more recent data.

In the St. Lucie Basin, most of the land in the noncoastal areas is used for the production of citrus and beef cattle. The extensive network of canals that drains these agricultural areas transports stormwater runoff containing nutrients, sediment, bacteria, and other pollutants. These reach the natural drainageways (such as the North and South Forks of the

St. Lucie River) and ultimately the St. Lucie Estuary and the South Indian River Lagoon. The St. Lucie Canal (C-44), the inland waterway that connects Lake Okeechobee to Florida's east coast, transports regulated releases of water from Lake Okeechobee and runoff from agricultural areas within the C-44 basin. Other major canals also transport stormwater from inland agricultural areas to the estuary. Canals C-23 and C-24 discharge water into the North Fork of the St. Lucie River and the C-25 Canal discharges to the Indian River Lagoon. These canals transport loads of nutrients and eroded sediment to the estuary and slugs of fresh water that create fluctuations in estuarine salinity levels. Urban and residential areas continue to expand in the coastal areas, with polluted urban stormwater runoff and seepage from septic tanks also contributing to the water quality problems in streams and canals. As a result, parts of the St. Lucie Estuary appear to be impaired by nutrients, copper, and low levels of DO. Nutrient loads, salinity fluctuations, and accumulations of sediment stress the estuarine ecology.

In the Loxahatchee River Basin, residential and urban growth appear to affect water quality more than agriculture. Much of this watershed remains as undeveloped wetland, but the northern part of Palm Beach County continues to be developed. Water quality issues in the river system are related to low levels of DO, nutrients, bacteria, and impaired biology. The federal Wild and Scenic status of the Northwest Fork of the Loxahatchee River affords the river some special status but does not fully protect it from polluted stormwater runoff from urban, residential, and agricultural areas in its watershed.

The TMDL program focuses on water quality; however, in both basins the amount and timing of freshwater flows are prominent concerns to the estuaries. Hydrologic modifications in the rapidly urbanizing watersheds of the main branches of the Loxahatchee River as well as diversion of surface water that once reached the Loxahatchee estuary via the C-18 Canal have significantly reduced the size of the watershed and the amount of water the river receives. The permanent opening of Jupiter Inlet has also resulted in adverse changes to the river system, allowing encroachment of salt water farther upriver.



Contents of This Report

- **Chapter 1: Introduction** briefly characterizes the purposes and content of the status report and describes how the watershed management cycle will be implemented in the Department's Southeast District.
- **Chapter 2: Basin Overview** characterizes the basins' general setting, water resources, and historical, current, and proposed watershed management activities and processes.
- **Chapter 3: Water Quality Evaluation by Planning Unit** provides, by basin planning unit (or groups of planning units), an evaluation of water quality, permitted discharges and land uses, an ecological summary, and a summary of planning and management activities.
- **Chapter 4: Planning List of Potentially Impaired Waters** contains the Planning List of impaired waterbodies and a summary of the methodology used in developing it. It also describes the relationship between the Planning List and the Verified List of impaired waterbodies, and contains a summary of water quality findings for the basin group.
- **Chapter 5: Strategic Monitoring and Data Evaluation** includes a summary of strategic monitoring and data evaluation priorities that are critical to the development of the Verified List of impaired waters during the next phase of the watershed management cycle. It also includes a general inventory of monitoring and data gathering activities by other groups and programs that could be incorporated into the assessment.

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Chapter 1: Introduction

Chapter Summary

This introductory chapter describes the purposes and content of the Status Report and explains the schedule for implementing the watershed management approach in the Southeast District of the Florida Department of Environmental Protection (Department). It also briefly describes the smaller assessment units, called planning units, used to prepare the report.



Total Maximum Daily Load

The maximum amount of a given pollutant that a waterbody can assimilate and remain healthy, such that all of its designated beneficial uses are met.

The Planning and Verified Lists

*The **Planning List** is the list of surface waters or segments for which TMDL assessments will be conducted to evaluate whether the water is impaired and a TMDL is needed, as provided in subsection 403.067(2), F.S.*

*The **Verified List** is the list of impaired waterbodies or segments for which TMDLs will be calculated, as provided in subsection 403.067(4), F.S., and which will be submitted to EPA pursuant to Section 303(d)1.c of the federal Clean Water Act.*

Purposes and Content of the Status Report

The Department is implementing a statewide watershed management approach for restoring and protecting water quality and addressing **total maximum daily load** (TMDL) program requirements. Under Section 303(d) of the federal Clean Water Act and the 1999 Florida Watershed Restoration Act, TMDLs must be developed for all waters that do not meet their designated uses (such as drinking water, recreation, and shellfish harvesting) and are thus defined as impaired.

TMDLs will be developed, and the corresponding reductions in pollutant loads allocated, as part of the watershed management approach, which rotates through the state's 52 river basins over a 5-year cycle. Extensive public participation from diverse stakeholders in each of these basins will be crucial throughout the different phases of the cycle. A detailed description of the legislative and regulatory background for TMDL development and implementation through the watershed management approach is available in **Appendix A**. **Appendix A** also contains a TMDL Fact Sheet summarizing the TMDL program. Background information on the Department's TMDL program, TMDL development and implementation, lists of impaired and potentially impaired waters, and assessments for other parts of the state are available at <http://www.dep.state.fl.us/water/tmdl/index.htm>.

This report presents a Planning List of potentially impaired waterbodies, identifies general water quality monitoring needs, and provides an overview of water quality restoration plans and projects (see the sidebar for a description of the contents of the Basin Status Report, by chapter). It is intended for distribution to an audience of potential stakeholders, including decision makers from federal, state, regional, tribal, and local governments; public and private interests; and individual citizens.

To be placed on the Planning List, waters must meet specific thresholds for data sufficiency and data quality requirements in the state's Identification of Impaired Surface Waters Rule. Developed in cooperation with a Technical Advisory Committee, it provides a science-based methodology for identifying impaired waters. The rule addresses chemical parameters, interpretation of narrative nutrient criteria, biological impairment, fish consumption advisories, and ecological impairment. The complete text of the Impaired Surface Waters Rule (IWR) is available at <http://www.dep.state.fl.us/water/tmdl/index.htm>.

The Status Report will be followed by a period of monitoring and data gathering and by an assessment report that documents the results of a detailed assessment of water quality. The assessment report will include additional data gathered from other agencies and groups doing monitoring in the basin and from the Department's own strategic monitoring, a more complete evaluation of water quality and biological resources, and a designated use attainment assessment for basin waters. The assessment will contain a Verified List of impaired waters required by the Florida Watershed Restoration Act and Section 303(d) of the federal Clean Water

Act. It will also serve as the basis for the biennial water quality assessment (a requirement under Section 305[b] of the federal Clean Water Act).

The Department will adopt the Verified List in accordance with the 1999 Florida Watershed Restoration Act (Section 403.067, Florida Statutes) and the Impaired Surface Waters Rule (Chapter 62-303, Florida Administrative Code). Once adopted, the list will be submitted to the U.S. Environmental Protection Agency (EPA) and will become the 303(d) list of impaired waters for the basin.

The first list, which is to be amended annually to include additional basin updates, was required by the EPA in 1998. Florida's 1998 303(d) list included a number of waterbodies in the St. Lucie and Loxahatchee Basin Group. These waterbodies are identified in Chapter 3. The most recent update of the 303(d) list was issued for the first group of basins in October 2002.

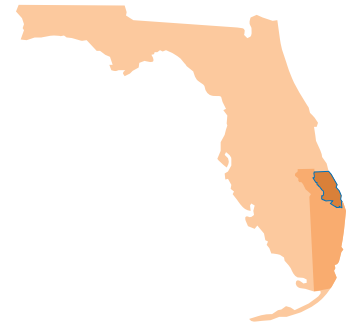
This Basin Status Report complies with the EPA's guidance for meeting Clean Water Act requirements for Section 305(b) water quality reports and Section 303(d) lists through a *2002 Integrated Water Quality Monitoring and Assessment Report*, also referred to as the Integrated Report. The integrated water quality assessment is used to identify the status of data sufficiency, the potential for impairment, and the need for TMDL development for each waterbody or waterbody segment.

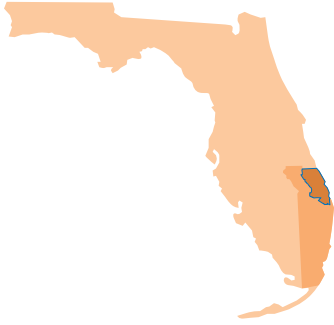
Coordination with South Florida Water Management District in Implementing the TMDL Program

The goals of the Department's TMDL program—to identify impaired waterbodies, develop targets for restoration, and establish a watershed management framework to improve water quality—complement water management district programs existing and underway.

For many years, the South Florida Water Management District (SFWMD) has exercised responsibilities related to water supply, floodplain protection and management, water quality, and protection of natural systems. For example, under the Surface Water Improvement and Management (SWIM) Act, SFWMD was responsible for putting into place a structure for addressing water quality problems and is presently involved in developing pollutant loading reduction goals (PLRGs) for the Indian River Lagoon and St. Lucie Estuary. The water management district has been the lead state/regional agency involved with the Comprehensive Everglades Restoration Program (CERP) and, with the U.S. Army Corps of Engineers (USACE), the Department, and others, developed a plan that includes regional solutions for improving water quality in the Indian River Lagoon/St. Lucie Estuary and the Loxahatchee River. More detailed descriptions of the SWIM and CERP program activities are provided in Chapter 2 of this report.

Throughout the various phases of this cycle, the Department and SFWMD will continue to work together in identifying, verifying, and addressing impaired waterbodies.





The Watershed Management Cycle in the Florida Department of Environmental Protection's Southeast District

Figure 1.1 shows the order in which the Department's Southeast District basin groups will be evaluated under the watershed management cycle. These groups are located within three hydrologic units defined by the U.S. Geological Survey (USGS). The Lake Okeechobee Basin, comprising Group 1 for this district and the first to be assessed, includes waters within the Lake Okeechobee and Taylor Creek hydrologic units. The Lake Okeechobee Group 1 basin is the subject of a Status Report that has already been completed. Group 2 includes watersheds that are located within parts of the St. Johns River-Upper, Indian River-South, and Southeast Florida Coast hydrologic units. Groups 3, 4, and 5 areas are all located in the Southeast Florida Coast hydrologic unit. This report focuses on Group 2, the St. Lucie and Loxahatchee Basins.

Preliminary assessment of Group 3 (Lake Worth Lagoon and Palm Beach Coast) and Group 4 (Southeast Coast and Biscayne Bay) areas of the Southeast Florida Coast are scheduled to begin in 2002 and 2003, respectively. Group 5, which includes the Everglades and the Florida Keys, will begin in 2004. In 2005, the cycle will return to the Group 1 basin, Lake Okeechobee.

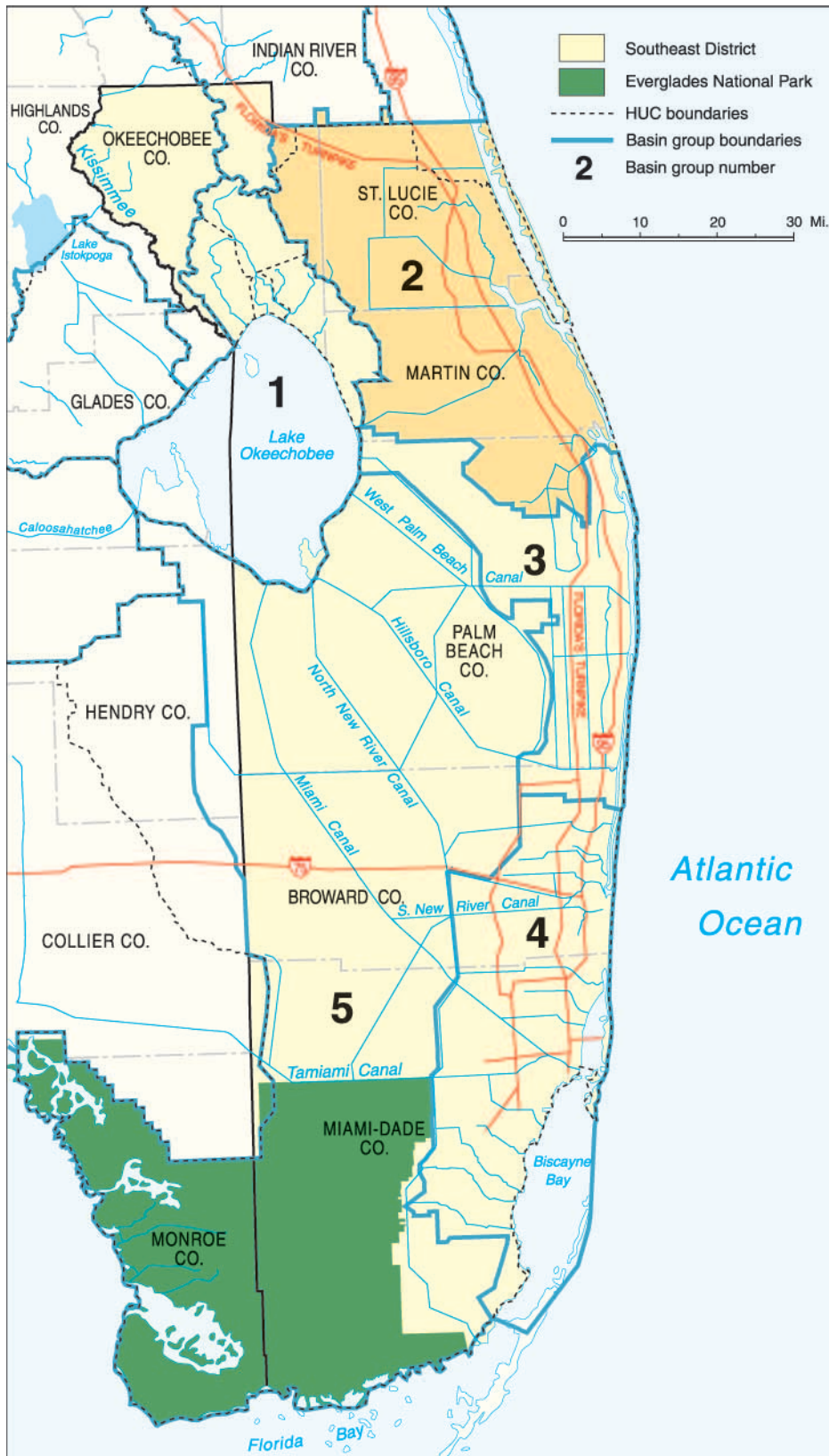


Figure 1.1: Schedule for Implementing the Watershed Management Cycle in the Department's Southeast District, Basin Groups 1 through 5



Chapter 2: Basin Overview

Chapter Summary

This chapter briefly describes the basin's setting and characterizes major surface water and ground water resources. It also summarizes historical, current, and proposed watershed management issues and activities.



Sources of Information

Much of the information about the St. Lucie and Loxahatchee Basins in this chapter was obtained from the Indian River Lagoon Surface Water Improvement and Management (SWIM) Plan produced by the St. Johns River and South Florida Water Management Districts (Steward, J., R. Virnstein, D. Haunert, and F. Lund, September 1994) and the Indian River Lagoon SWIM Plan Update (St. Johns River Water Management District [SJRWMD] and SFWMD, 2002). References also included the following:

- *Indian River Lagoon National Estuary Program Web site (<http://www.epa.gov/owow/oceans/lagoon>),*
- *Links through the SFWMD Martin/St. Lucie Service Center Web site (<http://www.sfwmd.gov/org/exo/mslsc/index.html>),*
- *Comprehensive Everglades Restoration Plan (CERP) Web site (<http://www.evergladesplan.org>), and*
- *Central and Southern Project Indian River Lagoon-South Feasibility Study Draft Integrated Feasibility Report and Supplemental Environmental Impact Statement (United States Army Corps of Engineers and South Florida Water Management District, October 2001 at http://www.evergladesplan.org/pm/studies/irl/irl_impact_statement.shtml).*
- *Loxahatchee River Watershed Action Plan—FDEP, October 1998*

Other references used are individually cited in this chapter.

Basin Setting

The St. Lucie and Loxahatchee River Basin Group 2 assessment area extends southward from the Indian River-St. Lucie county line, including most of St. Lucie and Martin Counties, to the northern part of Palm Beach County (**Figure 1.1**). The area defined as the St. Lucie River Basin includes the 1,050-square-mile drainage area of the St. Lucie River watershed and the C-25 Basin to the north. The adjacent Loxahatchee River Basin, to the south, includes the 278-square-mile watershed of the Loxahatchee River.

The Indian River Lagoon (IRL) south of Ft. Pierce Inlet (near the Indian River-St. Lucie county line) and the St. Lucie Inlet (in southern Martin County) are considered to be the South Indian River Lagoon segment of the IRL. The Loxahatchee River Estuary is considered by many to be a southern extension of the South Indian River Lagoon, thus extending the southern boundary to Jupiter Inlet (in northern Palm Beach County).

The IRL system (including the St. Lucie and Loxahatchee River Estuaries) is considered to contain the most diverse estuarine ecology in North America, but it exists in a delicate imbalance. It is threatened by stormwater runoff, disruptions in freshwater inflows, and other factors. Like elsewhere, the watershed of this southern extent of the IRL is changing. Increases in population, land use changes, and alterations of natural drainage patterns have resulted in impacts to water quality and the ecological health of the IRL, the St. Lucie and Loxahatchee River Estuaries, and their watersheds.

According to recent census figures, the populations in St. Lucie, Martin, and Palm Beach Counties have grown by more than 25, 28, and 31 percent, respectively, over the recent 10-year census period (U.S. Census Bureau, <http://quickfacts.census.gov/qfd/states/12000.html>). In the St. Lucie and Loxahatchee Basin area, population growth and urbanization have mostly occurred in near-coastal areas. The largest population centers include Ft. Pierce and Port St. Lucie (St. Lucie County); Stuart (Martin County); and Jupiter and Palm Beach Gardens (Palm Beach County). Other coastal communities and residential developments have extended from these population centers. Urban and suburban stormwater and treated wastewater from these areas are discharged directly or indirectly into the southern IRL, the rivers, and their tributaries.

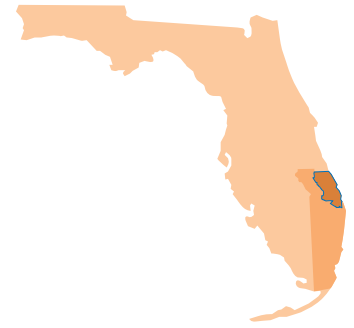
Human population is much lower in inland areas. Westward from the coastal area, extending as far as the Lake Okeechobee Basin, the St. Lucie Basin consists of former wetland areas that have been extensively drained and put into agricultural production. Beef cattle and citrus production are the largest agricultural practices in terms of area in the St. Lucie Basin. Beef cattle production occurs on rangeland and improved pasture covering more than 25 percent of the area. Citrus production, an agricultural practice that relies more heavily on irrigation, drainage, and use of agrochemicals, occupies more than 20 percent of the St. Lucie Basin. Stormwater runoff from these agricultural areas drains into the St. Lucie Estuary (SLE) and the IRL via networks of farm ditches, canals

maintained by county and water control districts, major canals maintained by South Florida Water Management District (SFWMD), and the remaining natural streams.

One of these canals, C-44 (also known as the St. Lucie Canal, St. Lucie Waterway, or Okeechobee Waterway), is part of an inland navigational route between the east and west coasts that was completed in the 1920s. C-44 connects Lake Okeechobee to the South St. Lucie River and transfers fresh water to the St. Lucie River when water is released from the lake. Excess fresh water entering the estuary from C-44 and discharges from the C-23 and C24 Canals have resulted in degradation due to extreme fluctuations of salinity, increased sedimentation, and discharges of nutrients and other pollutants. Record rainfall amounts in 1998 resulted in high discharges of fresh water from the lake through C-44 and caused particularly negative impacts to the estuary. This resulted in more attention being placed on the estuary's water quality and overall health by citizens, local governments, and federal, state, and regional environmental agencies.

In contrast to the St. Lucie Basin, the predominant land cover in the Loxahatchee River Basin remains as wetlands, and a much lower percentage of the area is used for agriculture. In this area, urban sprawl and development of new residential areas are of concern, both within the basin and in the rapidly developing area to the south. Within the Loxahatchee River Basin is an approximately 10,000-acre area known as Jupiter Farms that consists of large lot ranchettes, many of which support livestock. Jupiter Farms is located at the headwaters of the federally designated "Wild and Scenic" Northwest Fork of the Loxahatchee River and is a watershed for stormwater entering the river. Much of the Loxahatchee Basin that is not developed for residential purposes has been purchased or is being purchased for conservation. However, significant alterations to the Loxahatchee River watershed have reduced its overall size, modified the function of some of the major tributary streams, and significantly reduced the flow of the river. At this time, loss of flow to the Loxahatchee River (and the resulting ecological impacts) in many respects outweighs water quality issues as a concern to local water managers and the public.

Figure 2.1 shows the geopolitical features in the St. Lucie and Loxahatchee Basins.



Surface Water Resources

The South Indian River Lagoon segment, which includes the St. Lucie and Loxahatchee Basins, was poorly drained and had many connected and isolated wetland areas under natural conditions. Historically, the naturally functioning system absorbed floodwater, recharged ground water, and naturally allowed assimilation of nutrients and sediments. The area was nearly level and subject to frequent flooding. Under the Central and Southern Florida (C&SF) project of 1948, Congress authorized the U.S. Army Corps of Engineers (USACOE) to implement a major regional drainage and flood control program. The ensuing activities included construction of canals and levees, flood control structures, navigational locks, and impoundments.

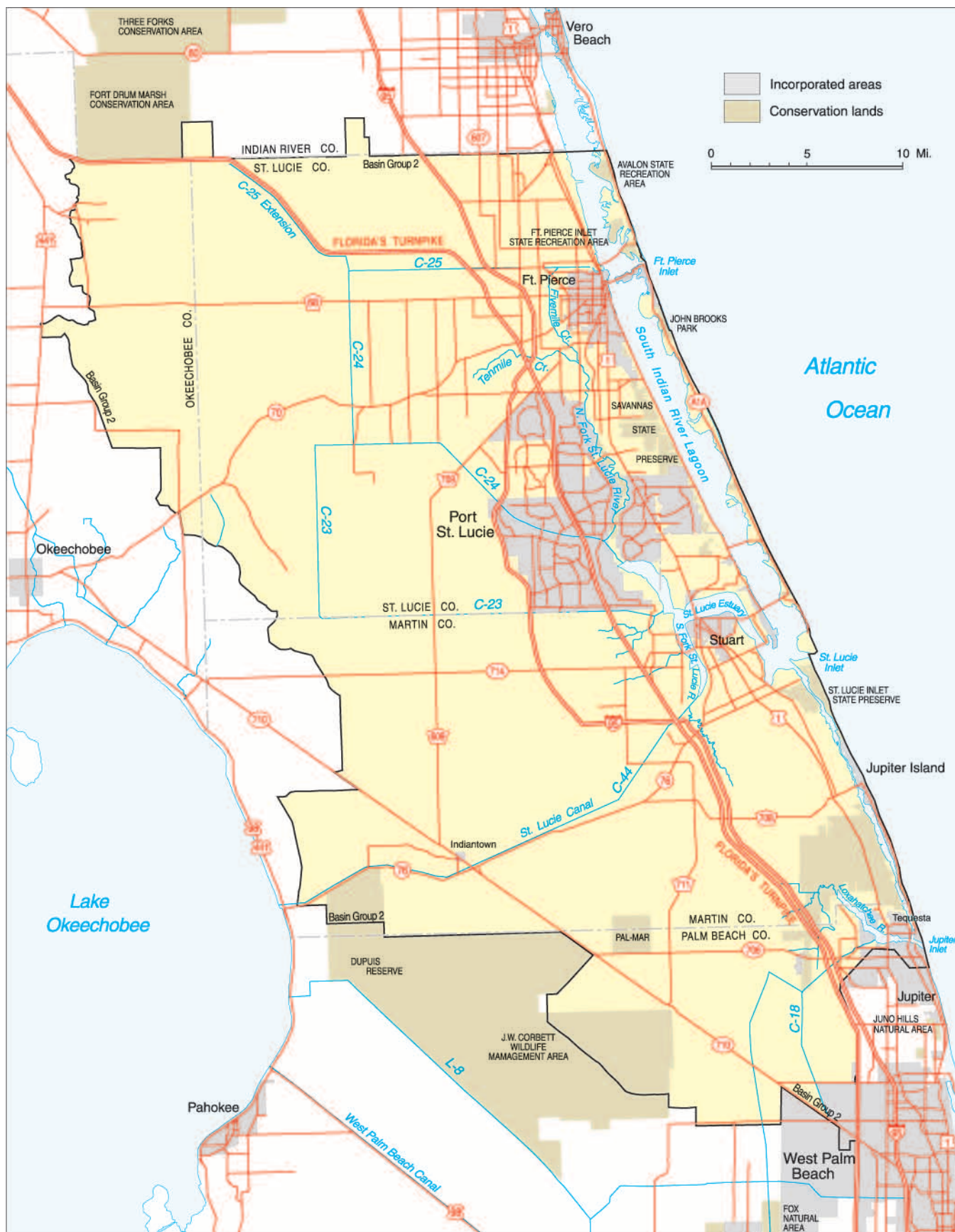


Figure 2.1: Geopolitical Map of the St. Lucie and Loxahatchee Basins

The C&SF program and accompanying smaller-scale drainage projects severely altered the hydrology and landscape of the area as wetlands were drained, natural drainage features were modified, and land was converted to the agricultural and urban/residential land uses of today.

St. Lucie Basin

In the St. Lucie Basin, all drainage is to the SLE and IRL. The inner SLE is composed of the South Fork and the North Fork of the St. Lucie River. The two forks converge to form a single middle estuary, which extends eastward to where it meets the IRL. Historically, this area included a much smaller natural watershed that directly contributed to the river system. Interior areas of Martin and St. Lucie Counties contained large expanses of poorly drained wetlands that did not directly feed to the river and estuary. With the construction of the various drainage improvements in the inland areas, however, the effective drainage area of the SLE and IRL expanded to include all of Martin and St. Lucie Counties.

As described previously, C-44 serves as a flood control conveyance for Lake Okeechobee and transports water from the lake into the South Fork. It also transports runoff from agricultural areas in its subbasin. The construction of canals C-25, C-24, and C-23 (in addition to C-44) provided connections between subbasins and effectively increased the watershed area of the St. Lucie River. Canals C-24 and C-23 discharge to the North Fork and provide drainage from their respective basins and from the western part of the C-25 Basin. Canal C-25, receiving agricultural runoff from northern St. Lucie County and areas to the north, discharges directly into the Indian River Lagoon north of the SLE across from the Ft. Pierce Inlet. The Ft. Pierce and St. Lucie Inlets are human-made inlets that allow for ocean access as well as tidal exchange between the estuary and the Atlantic Ocean. Prior to construction of the St. Lucie Inlet, the SLE was a freshwater lagoon.

Loxahatchee Basin

In the Loxahatchee River Basin, the major feature of the watershed is the Loxahatchee River. This watershed historically included more than 300 square miles of sloughs and wetlands in northern Palm Beach County and southern Martin County, but it has decreased in size and has been significantly modified as the area developed. The North Fork, Northwest Fork, and Kitching Creek are primary tributaries that are less altered by drainage modifications than others. Other natural tributaries (the Southwest Fork, Limestone Creek, and Cypress Creek) have been more significantly altered. Since the 1940s, drainage patterns within the basin have changed and the overall drainage area of the basin and amount of water available to the river have decreased. The changes include construction of the C-18 Canal and water control structures, and construction of secondary drainage canals to provide fresh water for development, flood control, and drainage of more land for agricultural and urban development.

The Northwest Fork of the Loxahatchee River has been greatly affected by the diversion of fresh water south to the West Palm Beach Water Catchment Area, previously part of the 300-square-mile watershed. At the turn





of the century, the Loxahatchee Slough, extending from the southern part of the Loxahatchee River Basin, was bisected, with its waters diverted or contained to supply water for northern Palm Beach County, in particular West Palm Beach. This reduced the size of the Loxahatchee River's watershed. Drainage of the remaining northern part of the Loxahatchee Slough through the C-18 Canal has greatly reduced flow to the Northwest Fork, with much of this water diverted to supply Palm Beach Gardens. Flow to Kitching Creek, a main tributary to the river, has been altered and reduced by road construction and agricultural drainage ditches for citrus production.

The dredging and creation of a permanent inlet to the Atlantic Ocean at Jupiter Inlet, which allows more salt water to enter the estuary, has also very significantly altered the natural hydrography and ecology of the estuary and the river. The Northwest Fork has lost six river miles of cypress swamp since the 1940s due to the encroachment of salt water caused by the dredging of the inlet and the decrease in flow of fresh water to the river (described previously).

Surface Water Quality Classifications and Special Designations

Florida's water quality standards program, the foundation of the state's program of water quality management, designates the "present and future most beneficial uses" of the waters of the state (Section 403.061[10], Florida Statutes). Water quality criteria, expressed as numeric or narrative limits of pollutants, describe the water quality necessary to maintain these uses for surface water and ground water. Florida's surface water is classified using five designated use categories:

Class I	Potable water supplies
Class II	Shellfish propagation or harvesting
Class III	Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife
Class IV	Agricultural water supplies
Class V	Navigation, utility, and industrial use (there are no state waters currently in this category)

There is one surface waterbody in the St. Lucie and Loxahatchee Basins that is Class I and used for potable supply. The C-18 Canal is used for potable supply for Seacoast Utility Authority (Seacoast) and the Town of Jupiter. Both utilities have consumptive use permits from SFWMD to draw water from C-18 to recharge their well fields. The C-18 Canal is a primary ground water recharge source for Seacoast but is used less frequently as a recharge source for wells for the Town of Jupiter. Several areas of the IRL and SLE are designated as Class II waters because they include commercially viable shellfish beds (**Figure 2.2**). All other waters in the two basins are considered to be Class III, which includes rivers, streams, canals, lakes, ponds, impoundments, wetlands, and estuaries. Although

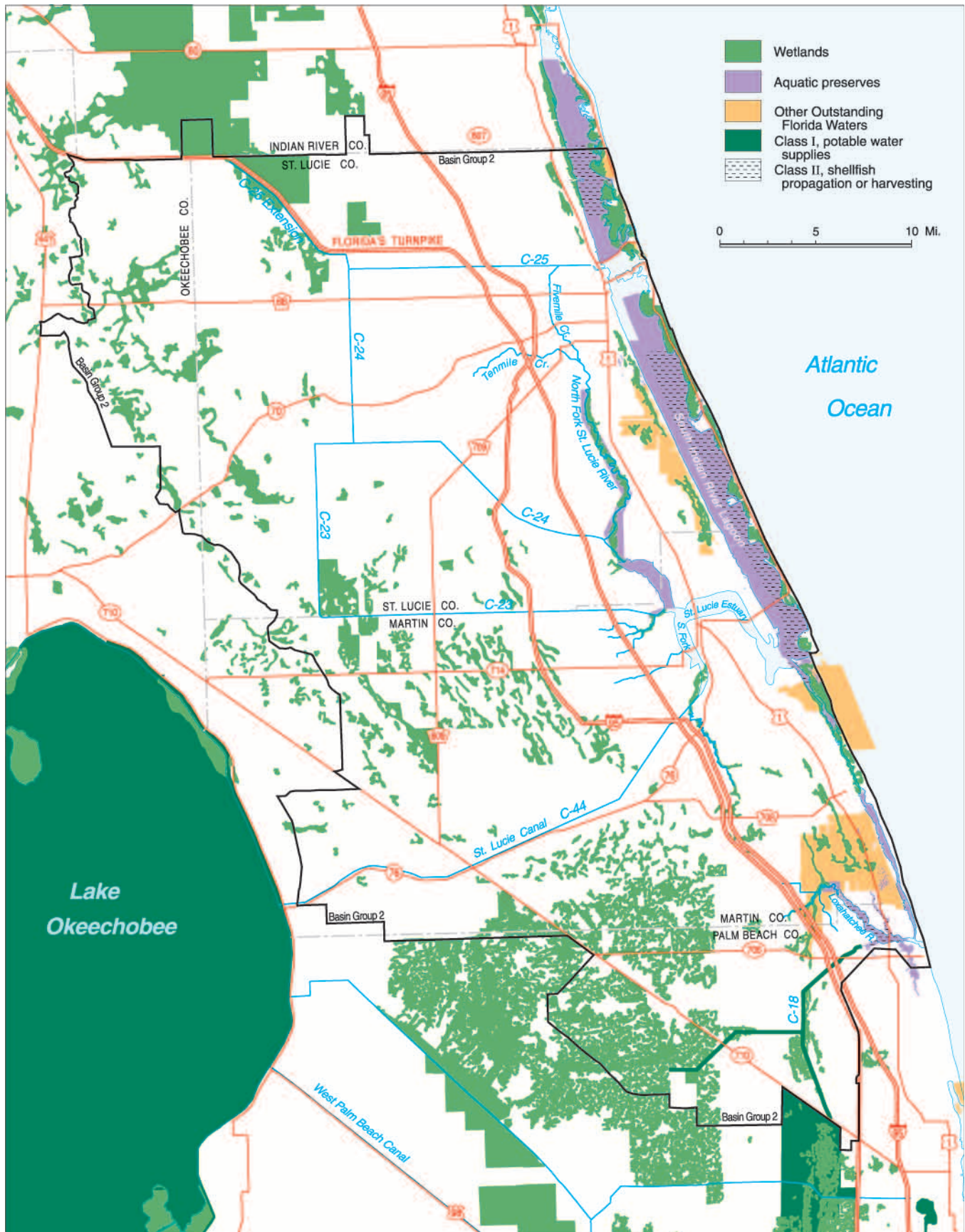
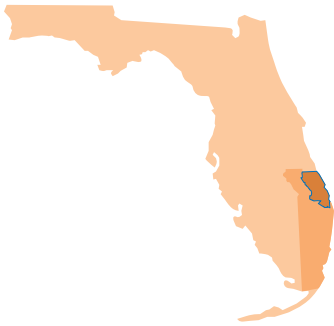


Figure 2.2: Surface Water Resources of the St. Lucie and Loxahatchee Basins



they may exist functionally, no Class IV waters have specifically been designated as such in these basins. As elsewhere in Florida, there are no waterbodies designated as Class V in these basins.

Outstanding Florida Waters (OFWs) are designated for special protection due to their natural attributes (Chapter 403.061, Florida Statutes). The intent of an OFW designation is to maintain ambient water quality, even if these designations are more protective than those required under the waterbody's surface water classification. Most OFWs are associated with managed areas in the state or federal park system, such as aquatic preserves, national seashores, or wildlife refuges. Other OFWs may also be designated as "Special Waters" and identified as such in Chapter 62-302, Florida Administrative Code. OFWs in the St. Lucie and Loxahatchee Basins are identified in **Figure 2.2**. Three of these, the IRL, Loxahatchee River, and North Fork of the St. Lucie River, are also designated as state aquatic preserves.

In 1985, the Northwest Fork of the Loxahatchee River was federally designated as the first Wild and Scenic River in Florida (Loxahatchee River National Wild and Scenic River Management Plan, Plan Update June 2000). The Wild and Scenic River Program was created as a means for providing some protection through implementation of river preservation and enhancement programs.

The Surface Water Improvement and Management (SWIM) Act of 1987 (Section 373.451-373.4595, F. S.) designated the IRL system as a priority waterbody in Florida for restoration and special protection. Because the lagoon system overlaps the jurisdiction of two water management districts, St. Johns River Water Management District (SJRWMD) and SFWMD, both districts developed a joint SWIM Plan for the system. However, the lagoon portion from St. Lucie Inlet to Jupiter Inlet is not covered by the SWIM Plan.

Under the District Water Management Plan (DWMP) for South Florida (SFWMD, 2000), the St. Lucie River and Estuary and the Loxahatchee River and Estuary were designated as priority waterbodies for the development of Minimum Flows and Levels (MFLs). Under the Florida Water Resources Act (Section 373, Florida Statutes), MFLs are defined and water management districts are required to develop and implement these flow levels. Draft MFLs were produced by SFWMD for the St. Lucie River and the Loxahatchee River in 2001. These waterbodies are priorities because consumptive use and alterations to their watersheds have reduced or have potential for reducing the amount and timing of water being delivered to their estuaries and projected increases in withdrawals also give concern that discharges could reduce in the future. This is particularly the case for the Loxahatchee River, where the alterations to its watershed have caused a significant reduction in delivery of fresh water and the adverse changes to the river's ecosystem have been well documented. Although it is not presently a problem, a minimum delivery of fresh water to the St. Lucie Estuary is equally important.

Ground Water Resources

Aquifers

Ground water is the primary source of drinking water for people who live in the St. Lucie and Loxahatchee Basins. The major aquifer systems in the basin are the surficial aquifer system and the Floridan aquifer system (Lukasiewicz and Smith, 1996; SFWMD, 1998). The surficial aquifer system within this area has fairly good water quality and is the primary source of drinking and irrigation water in urban areas. Ground water from the Floridan aquifer system is available, but its use as a drinking water supply is limited due to high dissolved solids and chloride concentrations. The Upper Floridan aquifer, however, is used extensively for citrus irrigation, especially in St. Lucie County.

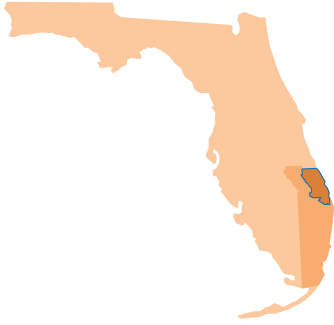
The surficial aquifer system is unconfined and composed of permeable sands (Pamlico Sand), limestone (Anastasia Formation), shell beds, and an unconsolidated mixture of clay, sand, and calcium carbonate (Caloosahatchee Formation). It is the primary source of potable water, although its water-bearing properties vary widely throughout the area. The surficial aquifer system exists near land surface in most of the basin and has a maximum thickness of approximately 200 feet. This unconfined shallow aquifer system is recharged by local rainfall and its water-bearing properties vary widely throughout the area. Low permeability sediments of the Miocene-age Hawthorn Group create a confining layer for the Floridan aquifer system and lie beneath the surficial aquifer system throughout the basin. The Hawthorn Group, composed of low-permeability phosphatic silts, clays, and marl, is approximately 200 feet thick at the northernmost boundary of the St. Lucie Basin and thickens to approximately 500 feet at the southern edge of the Loxahatchee Basin.

The Suwannee Limestone, Ocala Limestone, and Avon Park Formation are Oligocene to Eocene-age limestones that comprise the Upper Floridan aquifer in this area and underlie the Hawthorn Group. One to 8 different flow zones exist between these formations along unconformities and are frequently used for water supply wells. The thickness of the Floridan aquifer system in this basin ranges from 300 to 1,000 feet and thins toward the southern tip of the basin. The Lower Floridan aquifer, although present throughout the area, is seldom used as a water supply due to its much higher mineral content. Under natural conditions, the Floridan aquifer system is hydrologically isolated from the surficial aquifer system and is highly mineralized and saline. Recharge to the Floridan aquifer system occurs to the west and northwest of the basin where the confining unit is thinner and more permeable. Ground water flow in both the surficial and Floridan aquifer systems is generally eastward and northeastward toward the coast.

Ground Water Usage

The demands for water supply in South Florida vary seasonally with high winter demands from seasonal tourists and peak demands in spring for irrigation of agricultural crops. Although the surficial aquifer system is the primary source of potable water, reliance on the Floridan aquifer system





is increasing. Most ground water is withdrawn by municipal wellfields operated by St. Lucie West Utilities, Ft. Pierce Utilities, the city of Stuart, Jupiter Water System, and Seacoast Utility for Palm Beach Gardens. As the population continues to grow in this region, the demand on its water supply will be heightened, possibly increasing the use of treated ground water from the Floridan aquifer system. Currently, almost 50 percent of the potable water for Jupiter is drawn from the Floridan aquifer system, and the Village of Tequesta and Jupiter Island are putting in reverse osmosis (RO) plants to treat water from the Floridan aquifer system.

The agricultural industry has the highest freshwater withdrawals and utilizes surface water supplemented by ground water from both the surficial and Floridan aquifer systems. In western portions of the region, where surface water from canals is used for agricultural needs, a study showed that the existing surface water supplies might not be sufficient to meet the continuing water demands. According to the SFWMD, more than 70 percent of the irrigated acreage in St. Lucie and Martin Counties is under permit to use ground water from the Floridan aquifer system as a supplemental source. If demand does not increase, ground water from the Floridan aquifer system should be available to meet present and future agricultural needs without causing adverse impacts.

Critical Water Supply Problem Areas

Critical Water Supply Problem Areas have been designated in much of South Florida where water resources are critical or are anticipated to become critical over the next 20 years (Chapter 40E-23, FAC). There are also areas within these caution areas that have been categorized as Reduced Threshold Areas for obtaining consumptive use permits. Normally, consumptive use permits are required for daily withdrawals of 100,000 gallons per day (gpd) or greater, but in Reduced Threshold Areas permits are required for withdrawals that are 10,000 gpd or greater. All of St. Lucie and Martin Counties are identified as Critical Water Supply Problem Areas. Saltwater intrusion is a primary threat due to increased water use demands along the coast. It is also a problem where deeper wells tap artesian brackish and saline waters and due to construction problems allow intrusion of saltwater into freshwater zones. Over the years there were thousands of abandoned artesian wells tapping the brackish waters of the Floridan aquifer system that caused increases of saline water in freshwater zones of the surficial aquifer system. By aggressively implementing an abandoned well-plugging program, SFWMD has greatly reduced this problem.

Ground Water–Surface Water Interactions

The exchange of water between the surficial aquifer system and surface waterbodies is an important consideration in understanding the hydrology of this region. In this area, ground water discharge is important because of the shallow water table and the influence of human-made canals and control structures that intersect the surficial aquifer system. These canals are used to control water flow, prevent flooding, and provide drainage of otherwise inundated areas and they also serve to recharge ground water and replenish drinking water supplies. To better understand the contribution

of ground water to the St. Lucie Estuary and River and South Indian River Lagoon, SFWMD has initiated a study to chemically characterize and evaluate the inflows and outflows of water between the surficial aquifer and surface water bodies.

Historical, Current, and Proposed Watershed Management Activities and Processes

Over the years, management plans and activities in the basins have been implemented to eliminate wastewater discharge, reduce discharge of polluted stormwater from urban and agricultural areas, and protect, preserve, and restore special areas. The following sections summarize some of the historical, current, and ongoing programs and projects that address water quality problems in these basins.

Organizations Responsible for Waterbody Restoration and Preservation

There is no one organization solely responsible for water quality restoration plans and implementation of watershed and water quality improvements in this area. Much of the progress is attributable to coordinated local, state, and regional efforts. Many plans share common goals and their implementation is based on various groups playing critical roles in planning, funding, management, and execution of projects. The local organizations and initiatives described in **Table 2.1** provide leadership roles in waterbody restoration and preservation in the St. Lucie and Loxahatchee Basins.

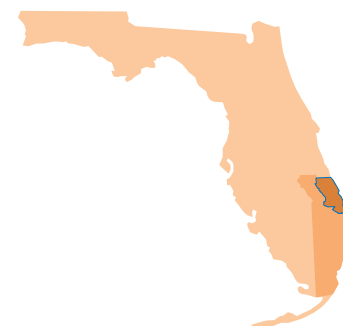


Table 2.1: Summary of Organizations Responsible for Waterbody Restoration

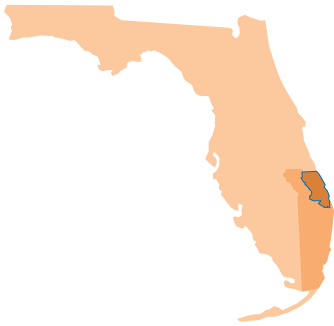
Organization	Role
Federal, State, or Regional Organizations	
South Florida Water Management District (SFWMD)	SFWMD is the sponsor for a wide variety of local and regional water quality planning, restoration, and monitoring efforts in the area. SFWMD is a key partner in the Indian River Lagoon (IRL) National Estuary Program (NEP), the lead regional agency for planning and implementing the IRL/SLE Feasibility Study under the Comprehensive Everglades Restoration Program (CERP), and the lead agency for many conservation land acquisition efforts. SFWMD is also responsible for operating and maintaining the major network of canals, levees, dikes, and control structures within the area.
Indian River Lagoon National Estuary Program	The St. Johns River Water Management District directs the IRL NEP, administered by the EPA, with key involvement by SFWMD and other stakeholders. The Comprehensive Conservation and Management Plan (CCMP) developed under the NEP provides a framework for coordinating activities to preserve, protect, restore, and enhance the Indian River Lagoon system.
U.S. Army Corps of Engineers (USACOE), Jacksonville District	The USACOE is the responsible lead federal role in CERP and the Indian River Lagoon-South and North Palm Beach County Projects that affect these basins.

Table 2.1 (continued)

Organization	Role
Federal, State, or Regional Organizations, continued	
U.S. Department of Agriculture Natural Resources Conservation Service (NRCS)	NRCS supports the agricultural community in conservation of soil and water, and reducing irrigation volumes and stormwater runoff from agricultural sites.
University of Florida Institute of Food and Agricultural Science (IFAS)	The Indian River Research and Educational Center of IFAS is responsible for carrying out valuable research to reduce wastewater loads from citrus operations and in the implementation of agricultural and urban best management practices (BMPs) to reduce nutrient loads to the estuary.
Indian River Citrus League	This organization for all citrus growers in the IRL and SLE watersheds is an important player in the implementation of BMPs to improve the quality, quantity, and timing of water draining from citrus operations.
Florida Department of Environmental Protection (Department)	The Department participates on several advisory boards and councils related to protection of the St. Lucie River, IRL, and Loxahatchee River. Many of the activities contributing to water pollution are regulated by the Department. The Division of Recreation and Parks manages two state parks and other state-owned lands within the two basins. The Department actively monitors water quality in the St. Lucie River Basin and sporadically in the Loxahatchee River Basin. It also funds and manages the removal of exotic vegetation on publicly owned lands and manages many state and federally funded contracts for restoration projects in these basins.
St. Lucie Basin Organizations and Local Governments	
St. Lucie River Issues Team	This organization of St. Lucie Basin stakeholders—representing regional, local, and state government agencies, environmental groups, and agricultural interests—funds, supports, prioritizes, and implements watershed and water quality improvement and protection projects.
St. Lucie River Initiative	This organization serves as advocate of the St. Lucie River and Estuary. Its function is to champion more effective action and communication between agencies and organizations responsible for protecting and restoring the river. The goals of the initiative are to improve the water quality and ecological integrity in the estuary through reduction of pollutant and freshwater inflows and restoration.
Martin County	Martin County is an active participant and leader in conservation land acquisition and watershed/water quality improvement measures. Wetland protection and stormwater treatment measures are key considerations in the county Comprehensive Plan for development.
City of Stuart	The city of Stuart implemented a stormwater utility program in 1994 to provide a steady, dependable source of funds to support stormwater projects within the city. The city has been responsible for implementing source controls and stormwater BMPs to provide treatment of water flowing into the SLE.
City of Port St. Lucie	Port St. Lucie started a stormwater management program in 1985 and a stormwater utility in 1988. In addition to drainage improvements, the stormwater utility supports a monitoring program.
City of Fort Pierce	Fort Pierce Implemented a stormwater capital improvement projects program.

Table 2.1 (continued)

Organization	Role
Loxahatchee Basin Organizations and Local Governments	
Loxahatchee River Environmental Control District (Loxahatchee River District)	Dedicated solely to the Loxahatchee River watershed, this organization has for nearly 30 years been responsible for public outreach, education, research, monitoring, and conservation and restoration projects that benefit the Loxahatchee River and its tributaries. It brought sewage treatment to the urban parts of the watershed and now provides reuse water for irrigation to conserve valuable water resources. It is the first agency to implement a regional stormwater management plan for this area.
Jupiter Inlet District	The District is responsible for the maintenance and preservation of the Jupiter Inlet, with a specific emphasis on the navigability of the inlet and the maintenance and preservation of the Loxahatchee River downstream of Jonathan Dickinson State Park. This agency has developed the "River Management Plan" as a guidance document for the long-term management of the Loxahatchee River.
Martin County	Martin County is an active participant and leader in conservation land acquisition and watershed/water quality improvement measures. Wetland protection and stormwater treatment measures are key considerations in the county Comprehensive Plan for development.
Town of Jupiter	This municipality has a broad range of responsibilities pertinent to water quality in the Loxahatchee River watershed. Besides protective ordinances and greenways projects, Jupiter has many stormwater improvement projects to retrofit older neighborhoods and industrial parks. They created a stormwater utility and drafted a stormwater management plan in 1994. In addition, facing increasing water shortages in northern Palm Beach County, the town took the step of investing in a reverse osmosis plant that went on-line in 1990. This step has improved ground water levels and helped protect wetlands from drying out during the recent drought.
Loxahatchee River Coordinating Council	This council was created in 1983 to develop the Loxahatchee River National Wild and Scenic River Management Plan. This plan was most recently updated in June 2000. Staffed by the SFWMD, this advisory group, consisting of agencies and citizens, meets at least quarterly to monitor activities and developments that may affect the natural or cultural values within the designated Wild and Scenic river corridor.
Loxahatchee River Watershed Planning Committee	This committee is a stakeholder group formed by the Department in 1996 to address environmental problems within the 278 square mile watershed. This group mapped the watershed then drafted the 1998 Loxahatchee River Watershed Action Plan. Water quality improvement projects are identified in the action plan for state and local funding.
Loxahatchee River Preservation Initiative	This subcommittee of the Watershed Planning Committee is seeking state funding for important water quality improvement projects in the watershed. They include stormwater retrofits for older neighborhoods, wetland/hydrologic restoration, and sewage treatment and potable water to campgrounds along the Northwest Fork of the Loxahatchee River.



Major Programs and Projects

There are major restoration initiatives, which, if continued, will have major positive effects on the water quality of the Indian River Lagoon and the St. Lucie Estuary.

IRL National Estuary Program and IRL Surface Water Improvement and Management Plan

The IRL National Estuary Program (NEP) was initiated in 1990 under a cooperative agreement between SJRWMD and EPA. With SJRWMD as sponsor and SFWMD, state agencies, and local governments participating, a Comprehensive Conservation and Management Plan (CCMP) was developed for the lagoon. As described previously, the IRL SWIM Plan (including the SLE but not the Loxahatchee Basin) was prepared as a joint initiative by SFWMD and SJRWMD. The SWIM Plan provided technical basis for the CCMP and has been the foundation for implementing many projects related to water quality improvement, restoration, improving public awareness, and assessment and monitoring. The goals of the SWIM program and the CCMP are to

1. Attain and maintain water and sediment quality entering the estuary and lagoon to support a healthy, seagrass-based estuarine ecosystem;
2. Attain and maintain the timing and distribution of fresh water and nutrients for a functioning seagrass ecosystem that supports endangered fish and wildlife;
3. Achieve heightened public awareness and coordinate interagency management; and
4. Identify and develop long-term funding sources for prioritized projects and programs to preserve, protect, restore, and enhance the IRL system.

Both water management districts recently updated the SWIM Plan. One of the projects under the IRL SWIM Plan that SFWMD is responsible for is the development of pollutant load reduction goals (PLRGs) for salinity, nutrients, and total dissolved solids in the IRL and the SLE. Once developed, these PLRGs can be used as targets for setting TMDLs, if they are required. Computer models are being used by SFWMD to evaluate pollutant load reduction strategies. Salinity models are being developed and used to simulate freshwater inflows into the estuary. In order to model watershed water quality, SFWMD has initiated a project to develop a watershed hydrology and water quality model (WaSh) that will be used to develop management strategies to improve water quality.

Comprehensive Everglades Restoration Program (CERP)

The purpose of this nationally significant federal and state program is to restore and preserve South Florida's natural ecosystems, while enhancing water supplies and providing flood control. The lead agencies are the USACOE and SFWMD. Implementation of this program will have the single largest impact in improving water quality, and timing and delivery of

water to the South IRL and the SLE. The C&SF Project of 1948 created the vast network of canals and levees, pumping stations, water control structures, and impoundments that control the hydrology of South Florida.

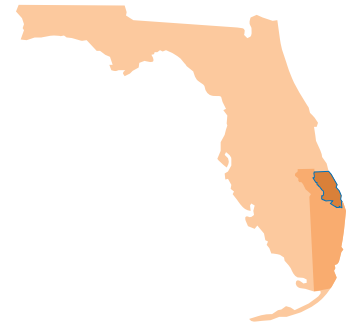
The CERP was commissioned to review the effects of the C&SF and find alternatives to restore/protect some of the natural systems. Under Section 528 of the Federal Water Resources Development Act, projects included in CERP must be designed to meet all federal, state, and local water quality criteria. Control of high nutrient loadings from drainage and irrigation canals is the primary water quality concern within CERP basins. TMDLs for impaired waterbodies in these basins will guide design criteria and water quality targets for these projects. The IRL and the North Palm Beach Projects are components of CERP that have great potential for significantly improving conditions within the St. Lucie and Loxahatchee Basins (see **Noteworthy**).

As a component of the CERP, the IRL-South Feasibility Study was initiated in 1996. A recent report (USACOE and SFMWD, October 2001) presents the IRL-South Plan. The Feasibility Study focuses on large-scale surface water management options in the canal basins of Martin and St. Lucie Counties. The objectives of the project are to improve quality, quantity, and timing of flows to the IRL and SLE; improve habitat quality of estuarine ecosystems; improve the functions of wetland ecosystems; reduce sediment loading and accumulation; improve water supply; and provide recreational enhancements. The recommended plan under the Feasibility Study includes

- construction of reservoirs and stormwater treatment areas to attenuate stormwater transported by C-23, C-24, C-25, and C-44 and to regulate and provide treatment of water being discharged to the IRL and SLE;
- restore wetland areas by creation of localized natural storage and water quality areas that will attenuate stormwater, provide ground water recharge and reduce the volume of water discharged to the C-23, C-24, and C-44 Canals;
- restore the natural flow of the North Fork of the St. Lucie River; and
- restore the ecological integrity of the SLE through removal of organic sediment and ooze and creation of artificial habitat for shellfish.

The North Palm Beach Project Part 1 of the CERP consists of several regional projects that collectively will improve hydrology and water quality, and increase storage areas within the L-8, C-51, C-17, and C-18 drainage basins. The purpose of this project is to allow for increased water supplies while restoring and enhancing receiving waters, including Loxahatchee Slough, the Lake Worth Lagoon, and the Northwest Fork of the Loxahatchee River. Elements of this CERP project are closely tied to other projects including the recently completed North Palm Beach County Comprehensive Water Management Plan and the ongoing L-8 General Reevaluation Report (GRR) study. Several of the proposed project elements included under the Part 1 project will

- help rehydrate the Loxahatchee Slough and the West Palm Beach Catchment Area,
- restore hydrologic connections between wetland areas,



CERP Activities Affecting Water Quality In This Area

Proposed CERP projects under the IRLS South (IRLS) Feasibility Study and North Palm Beach (NPB) Project Part 1 will have significant impact to water quality in waterbodies of the St. Lucie and Loxahatchee Basin Group. Below is a summary of the activities that are proposed.

Project Category	CERP Project/ Component	Location	Major Group 2 Waterbodies Receiving Benefits
Water Storage, Treatment, and Distribution	IRLS/C-23/24 Reservoirs and STA	C-23 and C-24 Canal Subbasins	North Fork St. Lucie River, St. Lucie Estuary
	IRLS/C-25 Reservoirs and RSTA	C-25 Subbasin	Indian River Lagoon, C-25 Canal
	IRLS/C-44 Reservoirs and STA	C-44 Subbasin	St. Lucie Estuary, C-44 Canal
	NPB/L-8/C-51 Reservoirs and STA	L-8 Basin (Group 3)	Northwest Fork Loxahatchee River
	C-17 Backpumping	C-17 Basin (Group 3)	Northwest Fork Loxahatchee River
Wetland Restoration/ Reconnection	IRLS/North Fork St. Lucie Natural Flood- plain Restoration	North St. Lucie Basin	North Fork St. Lucie River, St. Lucie Estuary
	IRLS/Cypress Creek Complex Natural Storage and Water Quality Area	C-24 Subbasin	C-24 Canal, St. Lucie Estuary
	IRLS/Allapattah Com- plex Natural Storage and Water Quality Area	C-24 Subbasin	C-23 Canal, C-24 Canal, North Fork St. Lucie River, St. Lucie Estuary
	IRLS/Pal-Mar Complex Natural Storage and Water Quality Area	South St. Lucie Subbasin	South Fork St. Lucie River, St. Lucie Estuary, C-44 Canal
	NPB/Pal-Mar and Corbett Hydropattern Restoration	Loxahatchee Basin	Northwest Fork Loxahatchee River, Loxahatchee Slough, Loxahatchee Estuary
Estuary Restoration	IRLS/Muck Remediation and Artificial Habitat	St. Lucie Estuary	St. Lucie Estuary

- increase base flows to the Northwest Fork of the Loxahatchee River, and
- reduce high discharges to the Lake Worth Lagoon, to the south of the Loxahatchee Basin.

St. Lucie River Issues Team Projects

The St. Lucie River Issues Team was formed in 1998 to develop federal, state, and stakeholder consensus on an action plan to accelerate progress toward improving water and habitat quality in the St. Lucie River and Estuary. The SFWMD Martin County Service Center provides guidance and staff support to the Issues Team. Major issues of concern to the team include the excess amounts of fresh water released into the estuary from Lake Okeechobee, the freshwater inflow and discharge of pollutants from urban stormwater, as well as freshwater consumption by agricultural and urban development. The Issues Team includes representatives of the key stakeholders in the St. Lucie Basin who developed an interim action plan and a list of projects to improve water quality in the SLE. The projects solicited and prioritized by the Issues Team are divided into four major categories: stormwater retrofits, water storage areas, restoration, and programs. In fiscal year (FY) 1999–2000, the Issues Team was successful in acquiring funding for 24 projects. In FY 2000–2001, there were 28 funded projects.

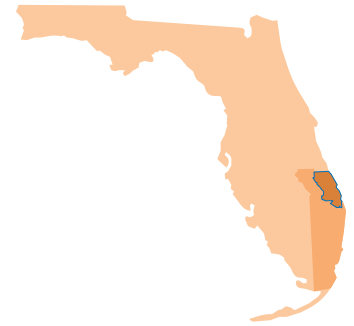
Loxahatchee River Watershed Planning Committee Initiatives

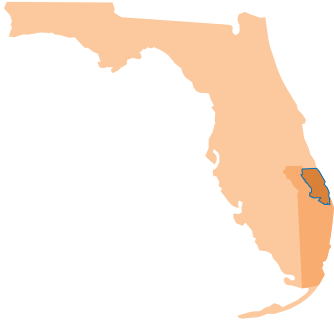
The Loxahatchee River Watershed Planning Committee, sponsored by the Department, is the stakeholder group responsible for formulating the Loxahatchee River Watershed Action Plan. The focus of this group is to protect and enhance the natural resources of the Loxahatchee River Watershed through coordination of public land acquisition, land use planning, and regulatory activities. Under this group, the Loxahatchee River Preservation Initiative is responsible for identifying and seeking state funding for water quality improvement projects in the watershed.

Agricultural Best Management Practices

Agricultural stormwater runoff contributes appreciably to water quality concerns related to nutrients and sediment in this area. The Florida Department of Agriculture and Consumer Services (DACS) is the state agency responsible for developing and implementing best management practices (BMPs) for agricultural practices and is responsible for assisting the agricultural community in taking voluntary measures to reduce the pollutants they generate. BMPs have also been developed by the University of Florida Institute of Food and Agricultural Science (IFAS), the U.S. Department of Agriculture (USDA), and the Department to assist the agricultural community in conserving water and reducing pollution from stormwater runoff.

Citrus groves cover a large percentage of the land area within the St. Lucie Basin as well as some of the Loxahatchee Basin. In 1999, a Water Quality/Quantity BMP manual for Indian River Area Citrus Groves was developed by IFAS (Boman et al., 1999), with full support by the Indian





River Citrus League. The citrus BMPs are intended to minimize off-site discharge of water after excessive rainfall; minimize off-site transport of sediments, nutrients, pesticides, and metals; and minimize proliferation of aquatic plants in waterways. This manual also addresses BMPs to minimize the transport of aquatic plants off-site to public waterways.

Pastureland also covers a large percentage of the St. Lucie Basin area. Most of this land is in beef cattle production. A BMP guidance document for Cow/Calf Operations was produced by the Florida Cattleman's Association in 1995 and is supported by the Department (Florida Cattleman's Association, 1999). This BMP manual presents practices intended to reduce off-site transport of nutrients, sediment, pesticides, and other toxic materials used routinely in cattle operations.

As TMDLs are developed for waterbodies in the St. Lucie and Loxahatchee Basins, implementation of agricultural BMPs will be critical in the attainment of water quality criteria. The Department and DACS will work with local agricultural interests in monitoring and refining BMP effectiveness.

Land Acquisition

Land acquisition programs preserve and restore the natural communities within the estuary and its watershed; create wetland treatment areas to store, attenuate, and help clean stormwater; and provide valuable buffers for pristine areas. Federal, state, regional, and local governments have contributed to land acquisition in this area. Programs such as Preservation 2000 (and its successor Florida Forever), the IRL Blueway Conservation and Recreational Lands (CARL) program project, the IRL Save Our Rivers (SOR) legislation, as well as local government initiatives, have been responsible for significant acquisitions. Some of these include

- Jonathan Dickinson State Park and Loxahatchee River Aquatic Preserve and Loxahatchee SOR project;
- the Savannas State Reserve and Recreational Area;
- the Indian River, Jensen Beach to Jupiter Inlet Aquatic Preserves;
- the North Fork St. Lucie River Aquatic Preserve;
- Pal-Mar;
- Loxahatchee Slough;
- the Atlantic Ridge; and
- the Dupuis Reserve.

Some of these land acquisitions support restoration efforts included in CERP projects, such as the recreation of natural flow ways in the Allapattah Flats and Pal-Mar, and the reconnection of floodplain along the North Fork of the St. Lucie River.

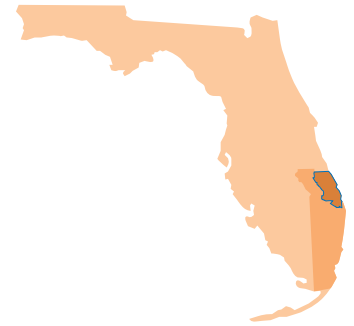
Public Awareness and Involvement

Public education and involvement in water conservation and water quality improvements are vital, particularly in residential areas where individual homeowners contribute appreciably to stormwater quality problems. The St. Lucie River Initiative sponsors the Adopt a Drop Program that provides education and advice to property owners about how they and members of their neighborhood can address stormwater problems. The Florida

Yards & Neighborhoods (FY&N) Program, created by IFAS, was developed to also address serious problems of pollution and disappearing habitats by involving homeowners and is ongoing in both the St. Lucie and Loxahatchee Basins. FY&N provides special educational and outreach activities directed at the community to help residents reduce pollution and enhance their environment by improving home and landscape management. Several groups are also focusing on environmental awareness programs, educational opportunities for children and adults, newsletters, and volunteer sampling programs in the Loxahatchee River Basin. A few of these include the Loxahatchee River District, the Loxahatchee River Watershed Environmental Education Committee, the Nature Conservancy, and the Busch Wildlife Sanctuary. The Loxahatchee River District also sponsors the “Friends of the Loxahatchee” group of concerned citizens.

South Florida Water Quality Protection Plan

The South Florida Water Quality Protection Plan (SFWQPP), funded in part by the EPA, was established in the spring of 1999 and was designed to provide integration of water quality protection efforts, develop a compendium of the existing water quality protection strategies, summarize existing water quality information, determine major pollutant sources, and document actions currently underway to address these sources. Due to the successful regulation efforts to mediate impacts from point pollution sources, nonpoint source pollution has become the single largest threat to South Florida waters. Nonpoint sources can be broadly subdivided into stormwater runoff from agricultural activities and stormwater runoff from urban development. Since BMPs would address stormwater runoff from agriculture under the purview of DACS, the initial focus of the SFWQPP has been toward addressing nonpoint source pollution arising from urbanization. To accomplish this, actions under the SFWQPP have included identifying, obtaining, reviewing, and evaluating stormwater control plans aimed toward maximizing their benefit to the overall effort to restore and maintain the South Florida ecosystem. Under this program, the Department is also involved in conducting an assessment of water quality conditions and pollutant loadings to waterbodies in the Northern Palm Beach County area, which includes the Loxahatchee Basin.





Chapter 3: Preliminary Surface Water Quality Assessment

Chapter Summary

This chapter summarizes the current status of surface water quality in the planning units of the St. Lucie and Loxahatchee Basins. The primary purpose of evaluating the status of surface water quality is to determine if individual waterbodies or smaller drainage basins identified with unique waterbody identification (WBID) numbers are potentially impaired. These waters, which must meet specific thresholds and data sufficiency and data quality requirements in the Identification of Impaired Surface Waters Rule (Section 62-303, Florida Administrative Code), will be listed on the state's Planning List of impaired waters.



The chapter also includes, for each planning unit, information on permitted discharges and land uses, ecological issues of concern, and current and planned restoration and protection projects to address water quality problems. Where sufficient data are available, temporal and spatial trends in water quality are also evaluated on a basinwide scale.

Preliminary Water Quality Assessment

*The primary purpose of the preliminary assessment of water quality is to determine if waterbodies or waterbody segments are potentially impaired. Waterbodies or segments that exceed evaluation thresholds and meet data sufficiency and data quality requirements in the Identification of Impaired Surface Waters Rule (Chapter 62-303, FAC) will be listed on the **Planning List** of potentially impaired waterbodies.*

DBHydro

DBHydro is SFWMD's corporate environmental database that stores hydrologic, meteorologic, hydrogeologic, and water quality data.

This chapter contains the results of a preliminary assessment of surface water quality in the St. Lucie and Loxahatchee Basin Group. It contains background information on sources of data, designated use attainment, the integrated water quality assessment reporting framework. It also describes the planning units in the basin used as a basis for the preliminary assessment.

Next, the chapter provides the results of the assessment. A section on each planning unit contains a general description, a water quality summary that includes concentrations of key water quality indicators (such as nutrients, chlorophyll *a*, dissolved oxygen [DO], and microbiological parameters) for each planning unit and waterbody segments within planning units, as appropriate. The discussion also notes where applicable surface water quality criteria have been exceeded, showing potentially impaired waterbody segments on maps. Permitted discharges, land uses, and ecological status are also summarized for each planning unit.

This chapter includes an identification of potentially impaired waters and their causative pollutants. However, it is not within the scope of this report to identify the specific sources of potential impairments. Information on the sources of impairment will be developed in subsequent phases of the watershed management cycle, including total maximum daily load (TMDL) development and implementation.

Sources of Data

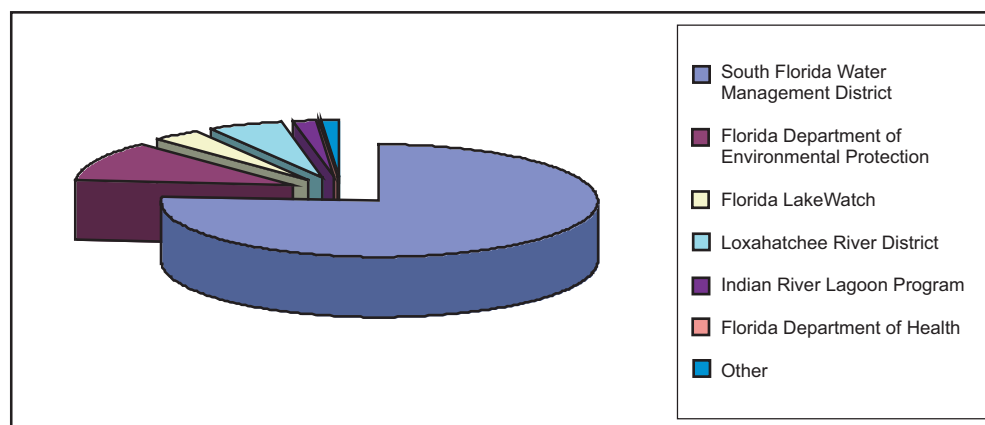
The assessment of water quality in the St. Lucie and Loxahatchee Basins includes an analysis of quantitative data from a variety of sources, some of which are readily available to the public. These sources include the SFWMD **DBHydro** water quality database, the U.S. Environmental Protection Agency's (EPA) Legacy and "new" **STORage** and **RETRieval** (STORET) databases, the U.S. Geological Survey (USGS), and the Florida Department of Health (DOH). The STORET databases contain water quality data from a variety of sources including the Department, the Loxahatchee River Environmental Control District, local governments, and volunteer monitoring groups. A detailed description of the dataset used in this evaluation and methodologies used to develop the Planning and Verified Lists are available in **Appendix B**.

Table 3.1 is a summary of the main data providers who contributed to the Impaired Surface Waters Rule (IWR) 2002 database for these two basins for the period record used in this assessment. **Figure 3.1** contains a pie chart showing the amount of data provided by each source.

The IWR 2002 database was created by the Department to evaluate data in accordance with the methodology prescribed in Chapter 62-303, FAC. For the Verified List assessment, the period of record for data is 7 years, and the Planning List period of record is 10 years. **Table B-1** in **Appendix B** shows the periods of record for the Group 1 through 5 Verified and Planning Lists in the first basin rotation cycle. Data collected for the St. Lucie and Loxahatchee Basin Group between January 1, 1991, and December 31, 2000, were evaluated to establish the Planning List.

Table 3.1: Summary of Data Providers in the St. Lucie and Loxahatchee Basin Group

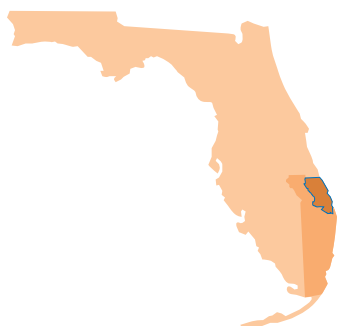
Organization	No. Records Collected by Calendar Year									
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
South Florida Water Management District	38201	34382	29244	31222	30775	29916	23687	26982	18455	22703
Florida Department of Environmental Protection	2057	6584	4931	3309	4347	7119	3337	3874	4292	2004
Florida Lake Watch	1800	1662	2286	1152	1026	918	828	1044	1458	1098
Loxahatchee Environmental Control River District	875	1696	1869	2974	3359	3139	3287	3712	—	—
Indian River Lagoon Program	523	1560	158	184	1364	844	—	2092	—	—
Florida Department of Health	—	—	—	—	—	—	—	—	—	231
Other	683	1657	262	207	203	216	210	228	633	414

**Figure 3.1: Sources of Data for the St. Lucie and Loxahatchee Basin Group**

To support listing decisions, the evaluation of water quality in this basin group also includes qualitative information drawn from the Indian River Lagoon (IRL) Surface Water Improvement and Management (SWIM) Plan, the Loxahatchee River Minimum Flows and Levels (MFL) report, and the IRL South Feasibility Study. Additionally, a draft document produced by the Department's Southeast District Water Quality Section, *St. Lucie Estuary: Evidence of Impairment* (Graves and others, June 2002), was used as the basis for supporting listing decisions for some of the St. Lucie Estuary segments.

Attainment of Designated Uses

According to Chapter 62-303, FAC, impaired waterbodies are defined as those that do not meet their designated uses. The designated use(s) of a particular waterbody is assigned based on the actual function(s) of that waterbody. Following EPA guidance, the water quality evaluations and impaired waters listing decision processes defined in Florida's Impaired



Surface Waters Rule (IWR) are based on the following designated use attainment categories:

Aquatic Life Use Support-Based Attainment
Primary Contact and Recreation Attainment
Fish and Shellfish Consumption Attainment
Drinking Water Use Attainment and Protection of Human Health

The designated uses assigned to the various surface water classes are summarized in **Table 3.2**.

Table 3.2 Designated Use Attainment Categories for Surface Waters in Florida

Designated Use Attainment Category Used in Impaired Surface Waters Rule Evaluation	Applicable Florida Surface Water Classification
Aquatic Life Use Support-Based Attainment	Classes I, II, and III
Primary Contact and Recreation Attainment	Classes I, II, and III
Fish and Shellfish Consumption Attainment	Class II
Drinking Water Use Attainment and Protection of Human Health	Class I

Integrated Report and Assessment Overview

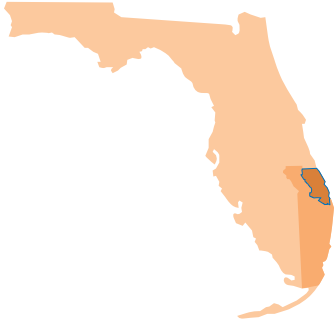
The EPA document, Integrated Water Quality Monitoring and Assessment Report (Wayland, November 19, 2001), provides guidance for merging the states' reporting requirements under the Clean Water Act for Section 305(b) surface water quality reports and Section 303(d) lists of impaired waters. Following the Status Report and further data evaluation, the Department will produce an Assessment Report integrating 303(d) lists and the basin-specific 305(b) report for this area.

Generally, following the EPA's guidance, the Department delineated waterbodies or waterbody segments in each of the state's drainage basins. These waterbodies or segments have been grouped into five major assessment categories and subcategories. These categories are used to designate waterbody status with respect to water quality, sufficiency of data, and TMDL development (**Table 3.3**).

This Basin Status Report contains a preliminary evaluation of waterbodies that fall into Integrated Report Categories 1 through 3 in the table. Out of 57 waterbodies/waterbody segments in the St. Lucie and Loxahatchee Basin Group, none fall into Category 1 (attaining all uses), 12 fall into Category 2 (attaining some uses but with insufficient data to completely assess), and 45 fall into Category 3 (having insufficient data). At this time, no waterbodies are designated as being within Category 4 (impaired but do not require a TMDL) or Category 5 (impaired and requiring TMDL). These designations will be proposed at the end of Phase 2 when the Verified List of impaired waters is formally presented.

Table 3.3: Categories for Waterbodies or Waterbody Segments in the 2002 Integrated Report

Category	Description	Comments
1	Attaining all designated uses	If use attainment is verified for a waterbody or segment that was previously listed as impaired, the Department will propose that it be delisted.
2	Attaining some designated uses and insufficient or no information or data are present to determine if remaining uses are attained	If attainment is verified for some designated uses of a waterbody or segment, the Department will propose partial delisting for the uses attained. Future monitoring will be recommended to determine if remaining uses are attained.
3a	No data and information are present to determine if any designated use is attained	Future monitoring will be recommended to determine if designated uses are attained.
3b	Some data and information are present but not enough to determine if any designated use is attained	Future monitoring will be recommended to gather sufficient information and data to determine if designated uses are attained.
3c	Enough data and information are present to determine that one or more designated uses may not be attained according to the Planning List methodology	This indicates a waterbody or segment is potentially impaired for one or more designated uses. Future monitoring will be recommended to verify use attainment or impaired status.
3d	Enough data and information are present to determine that one or more designated uses are not attained according to the Verified List methodology	This indicates that a waterbody or segment exceeds Verified List screening criteria and may be listed as impaired at the end of Phase 2 of the watershed management cycle. However, the data have not yet been evaluated and the waters have not been formally verified as impaired. Further monitoring and analysis may be necessary.
4a	Impaired for one or more designated uses but does not require TMDL development because a TMDL has already been completed	After a TMDL for the impaired waterbody or segment is approved by EPA, it will be included in a Basin Management Action Plan to reduce pollutant loading toward attainment of designated use(s).
4b	Impaired for one or more designated uses but does not require TMDL development because impairment is not caused by a pollutant	This category includes waterbodies or segments that are degraded because of pollution (e.g., stream channelization, other hydrologic modifications, etc.), rather than specific pollutants.
4c	Impaired for one or more designated uses but does not require TMDL development because a pollution control measure will improve water quality to meet standards	Reasonable assurance must be provided that the pollution control measure will be implemented and that it will be effective in attaining standards and restoring the designated use(s) of the waterbody in the future.
5	One or more designated uses are not attained and a TMDL is required	Waterbodies or segments in this category are impaired for one or more designated uses by a pollutant or pollutants. Waters in this category are included on the basin-specific Verified List adopted by the Department's Secretary as Florida's impaired waters list and submitted to the U.S. Environmental Protection Agency as Florida's 303(d) list of impaired waters at the end of Phase 2.



Because not enough recent data on chemistry, biology, and fish consumption advisories have been collected, currently only a few waterbodies or waterbody segments statewide fall into Category 1. In particular, fish tissues in many waterbodies statewide have not been tested for mercury.

More waterbodies and segments fall into Category 2 than Category 1 because monitoring programs can sometimes provide sufficient data for partially determining whether a designated use in a particular waterbody is obtained.

However, most waterbodies in the state fall into Category 3. In the St. Lucie and Loxahatchee Basin Group, the breakdown of waterbodies/segments in Category 3 is as follows:

- none for which no data are available to determine their water quality status (i.e., Category 3a);
- twenty-one with some data, but not sufficient data for making any determinations (i.e., Category 3b);
- five that are potentially impaired based on the Planning List criteria (i.e., Category 3c); and
- nineteen that may be impaired based on the Verified List criteria but require further evaluation (i.e., Category 3d).

Several potentially impaired (Category 3c or 3d) waters fail to meet water quality standards for DO, or show signs of biological stress or nutrient impairment. According to the IWR, specific pollutants causing DO exceedances or biological stress, or an underlying nutrient imbalance creating an imbalance in flora or fauna, must be documented for a WBID to be listed as impaired. Sometimes these conditions cannot be linked to a causative pollutant, and sometimes they may reflect natural background conditions.

Category 4 includes those waterbodies/segments that are impaired but do not require a TMDL for one of three reasons: (1) because a TMDL has already been developed (Category 4a); (2) their impairment is not attributable to a pollutant or pollutants but is due to other alterations to the waterbody (Category 4b); or (3) there is reasonable assurance that the designated use of an impaired waterbody will be restored by a pollutant control measure. There are presently no Category 4 waters that have been proposed for the St. Lucie and Loxahatchee Basin Group. These would be proposed along with the Verified List.

Category 5 waterbodies have been determined to be impaired and requiring TMDLs. These will be included on the Verified List of impaired waters adopted by the Department's Secretary.

Planning Units

The St. Lucie and Loxahatchee Basins encompass many square miles. To provide a smaller-scale geographic basis for assessing, reporting, and documenting water quality improvement projects, the Department subdivided the Group 2 area into smaller areas called planning units. Planning

units help organize information and management strategies around prominent subbasin characteristics and drainage features.

To the extent possible, planning units were chosen to reflect sub-basins that had previously been defined by SFWMD. The St. Lucie and Loxahatchee Basins contain eight planning units: C-25/Basin 1, North St. Lucie, C-24, C-23, South St. Lucie, C-44, Loxahatchee, and Coastal.

Figure 3.2 shows these planning units.

Water quality assessments were conducted on individual waterbody segments within planning units. Each waterbody segment is assigned a unique waterbody identification (WBID) number. Waterbody segments are the assessment units or polygons that have historically been used by the Department to define waterbodies in our biannual inventory and reporting of water quality to EPA under Section 305(b) of the federal Clean Water Act. The same WBIDs are also the assessment units identified in the Department's biannual lists of impaired waters submitted to EPA as part of our reporting under Section 303(d) of the Clean Water Act.

Table 3.4 includes a list of the planning units and their descriptions. The remainder of this chapter includes by-planning-unit discussions with detailed descriptions of the planning units, information on land use and



Table 3.4: Planning Units in the St. Lucie and Loxahatchee Basins

Planning Unit	Description
C-25/Basin 1	The northwestern subbasin in the south segment of the IRL. Includes a complex network of canals for agricultural drainage (C-25, Basin 1, C-25 East, and the Ft. Pierce Farms Canal). Basin 1 includes the Ft. Pierce Farms Water Control District.
North St. Lucie	Extends from Ft. Pierce Inlet to the St. Lucie Inlet and westward to the C-24 Canal. Historically has drained naturally into the St. Lucie Estuary and includes the North Fork St. Lucie River and its main tributaries, Tenmile Creek, and Fivemile Creek. Planning unit also includes the North St. Lucie Water Control District, located in the northern part where drainage is to Tenmile Creek, C-25 Canal, and C-24 Canal.
C-24	Located west of the North St. Lucie planning unit and mostly outside the area that would naturally discharge to the IRL. Construction of the C-24 Canal created an outlet to the St. Lucie Estuary (SLE). Agricultural canals extensively improve drainage of this planning unit. Planning unit is not further divided into subbasins.
C-23	Located south of C-24 and, like C-24, is not further divided into subbasins. Agricultural drainage canals in this planning unit discharge to C-23, which can discharge to the North Fork of the St. Lucie River.
South St. Lucie	Includes the natural drainage of the South St. Lucie River and contains several other drainage areas including Basin 2, Bessey Creek (Basin 4), Basin 5, Basin 6, and the Tidal St. Lucie drainage. Also includes the outlet of the C-44 Canal to the estuary.
C-44	Includes the St. Lucie Canal, which is part of the navigational route between the east and west coasts of Florida and directly connects Lake Okeechobee to the St. Lucie River. Agricultural canals locally improve drainage. Planning unit is not further divided into subbasins.
Loxahatchee	Includes the Loxahatchee River and its tributaries. Contains multiple drainage basins. Main tributaries include North, Northwest, and Southwest Forks of the river, Kitching Creek, the C-18 Canal, and Cypress Creek.
Coastal	Includes the North Coastal, Mid Coastal, and South Coastal subbasins of the St. Lucie River Basin and the Coastal subbasin of the Loxahatchee River Basin. South IRL and most of SLE are included as well as three inlets to the Atlantic Ocean.

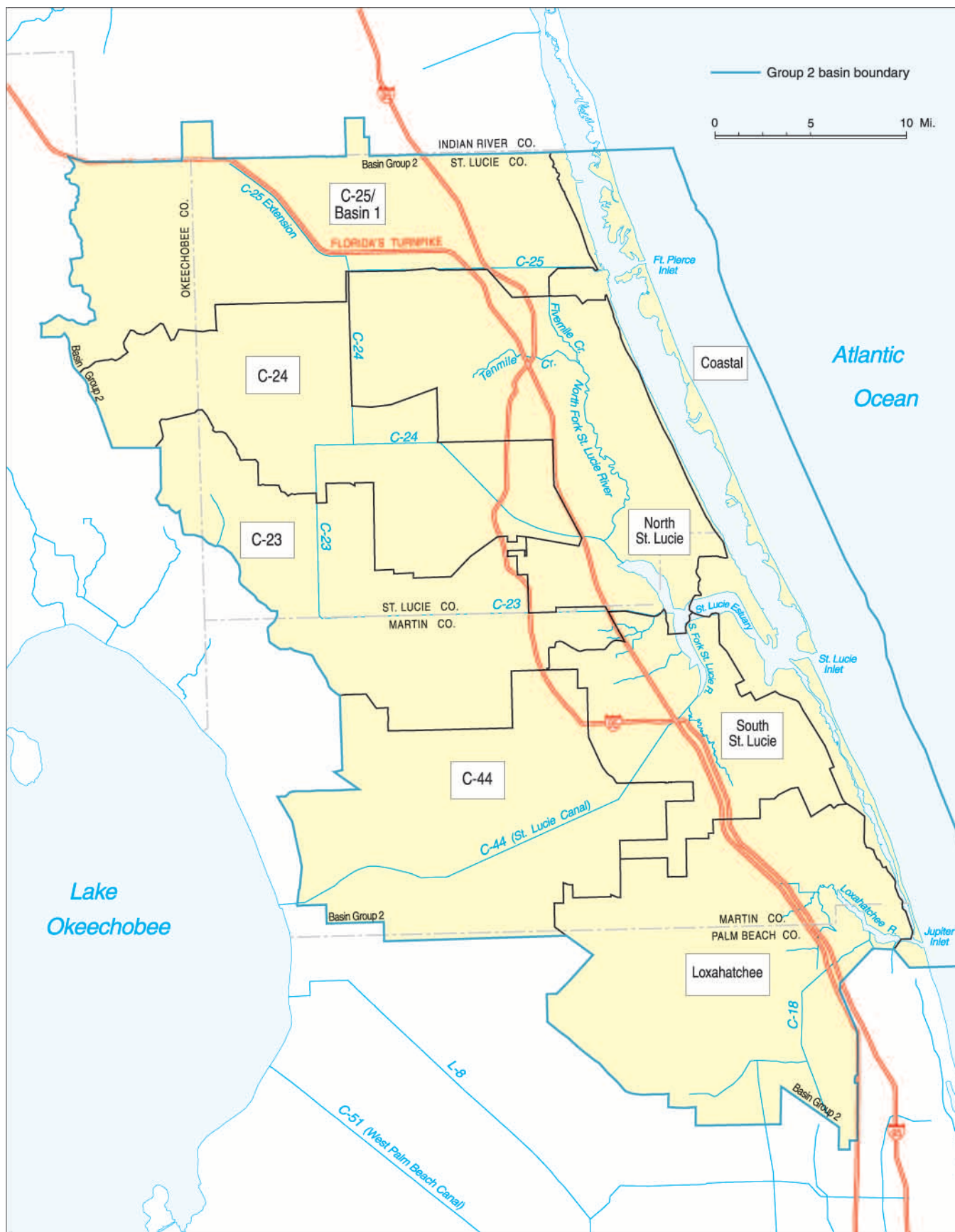


Figure 3.2: Locations and Boundaries of Planning Units in the St. Lucie and Loxahatchee Basin Group

potential point sources of pollution, water quality assessments for the individual waterbody segments, and summaries of the ecological issues and watershed management activities within each planning unit.

To determine the status of surface water quality in the St. Lucie and Loxahatchee Basin Group, chemistry data, biological data, and, if available, fish consumption, beach closure, and shellfish-harvesting advisories were evaluated to determine potential impairments. A detailed description of the methodology used to develop the Planning and Verified Lists is available in **Appendix B**.

Appendix C of this report contains definitions and specific methods for the generation and analysis of bioassessment data. **Appendix D** includes summary information for permitted wastewater treatment facilities, Superfund sites, and permitted landfill facilities in the basin. **Appendix E**, which provides a water quality summary by planning unit, contains a list of water quality monitoring stations, the integrated assessment summary, and trend data. **Appendix F** lists Level 1 land uses by planning unit.

- **C-25/Basin 1 Planning Unit**

General Description

This planning unit includes the watershed of the C-25 Canal (also known as Belcher Canal), which transports water eastward across northern St. Lucie County from near the St. Lucie-Okeechobee County border. It includes the C-25, Basin 1, and C-25 East subbasins that are defined by SFWMD. The USGS includes all of these but Basin 1 in the Southeast Florida Coast hydrologic unit. Basin 1 lies in the Indian River South hydrologic unit, as defined by USGS. The planning unit includes a complex network of canals primarily for agricultural drainage that has created a conveyance for discharge to the IRL. Runoff from the western part of the planning unit can discharge southward to the C-24 Canal via the C-25 extension (C-25 EXT). Runoff from the eastern and central portions of this subbasin is conveyed eastward through the S-99 structure on the C-25 Canal. Basin 1, east of S-99, receives drainage from the Ft. Pierce Farms Water Control District (WCD) that was established under Chapter 298, Laws of Florida. The Ft. Pierce Farms WCD Canal #1 is the primary surface water conveyance for Basin 1, providing drainage of the agricultural area and inhibiting saltwater intrusion. Canal #1 and C-25 discharge into the South IRL through the mouth of Taylor Creek at Ft. Pierce. The eastern part of this planning unit includes the northern edge of the Ft. Pierce city limits. **Figure 3.3** is a composite map of this planning unit that shows potentially impaired waters and potential point sources of pollution.



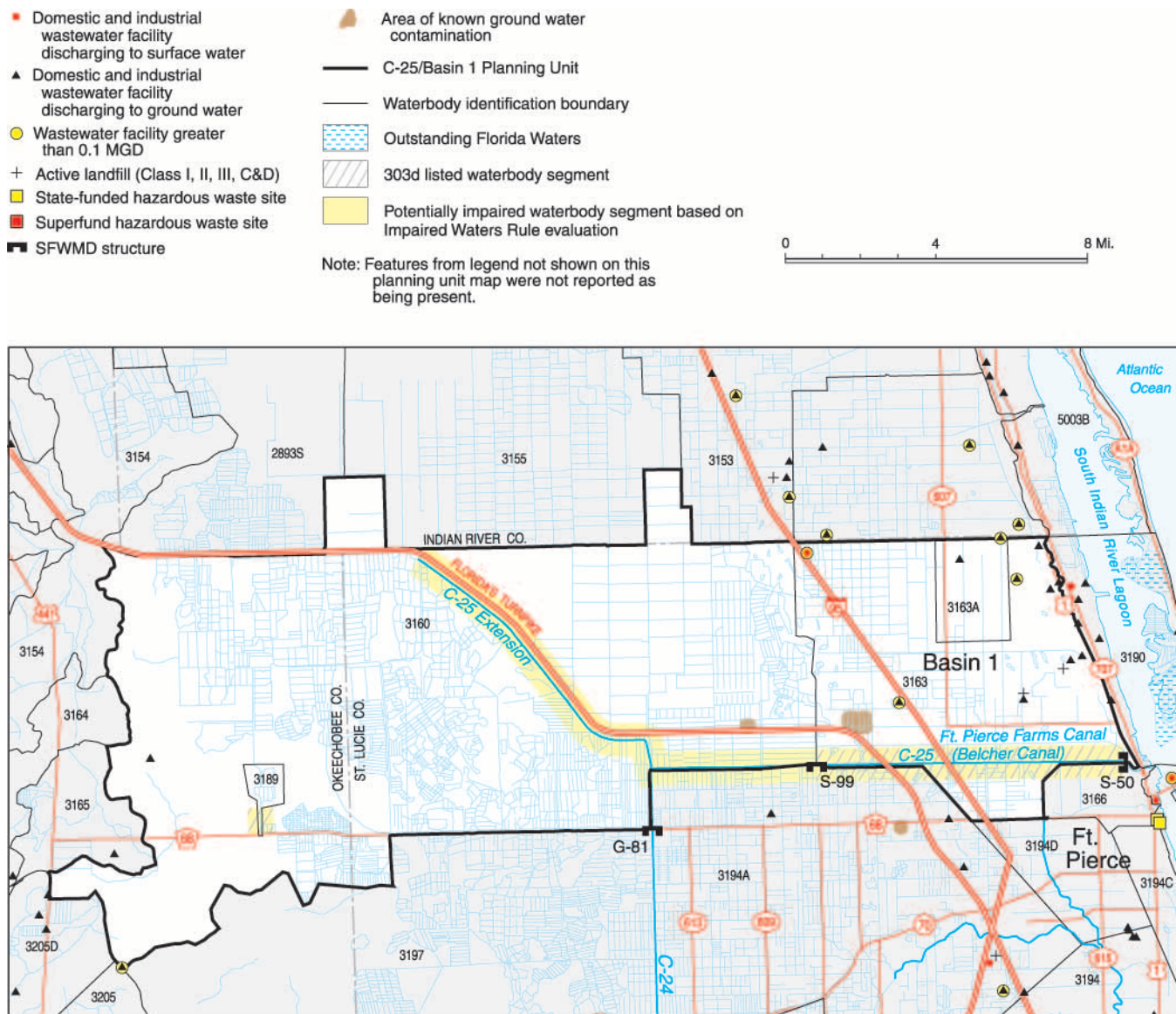


Figure 3.3: Composite Map of the C-25/Basin 1 Planning Unit

Water Quality Summary

Table 3.5 includes a summary of the water quality assessment status of all waterbody segments within the planning unit. Waterbodies represented by these data include the C-25 Canal, lakes within the Lakewood Park subdivision, and Cowbone Creek.

The table and figure show three waterbody segments in this planning units as potentially impaired. Two segments of the C-25 Canal, 3160 (C-25 West) and 3163 (C-25 East/Ft. Pierce Farms), were found in the IWR evaluation to be potentially impaired for DO, exceeding the Verified List screening criteria. Segment 3163 is also included on the 1998 303(d) list for nutrients and DO and has a 2002 TMDL development due date. To verify impairment of waterbodies based on DO exceedances, causative pollutants need to be identified. The C-25 Canal was the only waterbody in segments 3160 and 3163 that had sufficient data to be evaluated under the IWR criteria. However, preliminary evaluation of data not yet included in the IWR database indicates that Canal #1, of the Ft. Pierce Farms Drainage District (in 3163), may also be impaired for certain constituents. In future evaluations, Canal #1 will be assessed as a discrete waterbody.

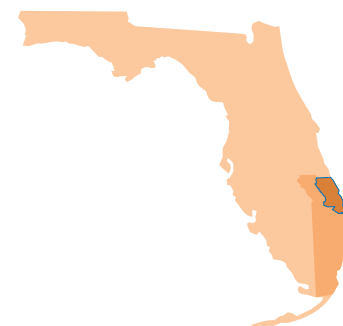


Table 3.5: Integrated Water Quality Assessment Summary for the C-25/Basin 1 Planning Unit

WBID	Waterbody Segment	Waterbody Type ¹	Class ²	1998 303(d) List Parameters of Concern	Data Evaluation per 2001 Impaired Surface Waters Rule Criteria		
					Parameters Potentially Impaired ³	Parameters Not Impaired	Integrated Assessment Category of WBID
3160	C-25 Canal West (St. Johns Marsh)	Stream	3F	N/A	DO	Arsenic, Turbidity, Unionized Ammonia	3d Verified List
3163	C-25 East/ Ft. Pierce Farms (Belcher Canal/ Taylor Creek)	Stream	3F	Nutrients, DO	DO	Arsenic, Iron, Turbidity, Unionized Ammonia	3d Verified List
3163A	Lakewood Park Lakes	Lake	3F	N/A	N/A	Tropic State Index	2 Meets Some Uses
3189	Cowbone Creek (C-25)	Stream	3F	Coliform, Nutrients, DO	DO, Fecal Coliform	Turbidity	3c Planning List

Notes:

¹The designation “stream” includes canals, rivers, and sloughs. The designation “lake” includes some marshes.

²The state’s surface water classifications are as follows:

Class I: Potable water supplies

Class II: Shellfish propagation or harvesting

Class III: Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife

Class IV: Agricultural water supplies

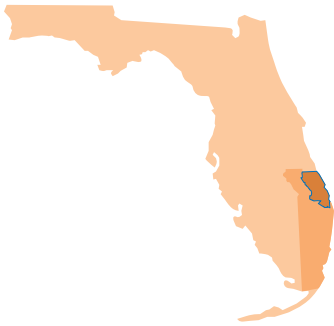
Class V: Navigation, utility, and industrial use (there are no state waters currently in this class)

³Parameters in **bold** meet Verified List screening criteria

F = Fresh water

M = Marine

N/A = Not applicable, no parameters listed.



Nonpoint Sources and Land Use

*Rainfall generates storm-water runoff, which as it flows over the land surface and through the ground, may carry nonpoint source pollution from many different sources to the canals, rivers, and estuaries of the watershed. Nonpoint sources also include atmospheric deposition and leaching from agricultural lands, urban areas, and nonvegetated lands. In many areas, these sources are the major cause of surface and ground water pollution. Land uses typically define the likelihood and nature of nonpoint source pollution within a watershed. The pollutants—including nutrients, bacteria, heavy metals, and sediments—and their concentrations are related to land use. General land use summary information for the planning units is provided in **Appendix F**.*

The Lake Park Lakes that were evaluated (3163A) appear to not be impaired for nutrients, based on LakeWatch monitoring data, but do not have sufficient data to be evaluated for other parameters. Cowbone Creek (3189), a channelized stream system in the western part of the planning unit, is potentially impaired for DO and fecal coliform (based on the Planning List screening criteria). Cowbone Creek is also included on the 1998 303(d) list for coliform, nutrients, and DO.

Permitted Discharges and Land Uses

Point Sources. In this planning unit, Department records indicate that there are 12 permitted wastewater treatment facilities, only 2 of which discharge directly to surface water. The facility having the largest design flow is the Spanish Lake Fairways Reverse Osmosis Plant, which is permitted for a design capacity of 0.78 million gallons per day (mgd) and has an industrial wastewater permit to discharge to surface water. The other permitted facility that discharges to surface water is the Larson Dairy Barn #4. The second largest treatment facility is also for Spanish Lakes Fairways, which has a domestic wastewater design capacity of 0.25 mgd, but does not discharge directly to surface water. Other potential point sources include landfills. There is one Class I solid waste landfill in the planning unit, which is currently not in operation. There are no state-funded or federal (National Priorities List [NPL]) hazardous waste cleanup sites within this planning unit, although there are 2 delineated areas of ground water contamination for the agricultural chemical ethylene dibromide (EDB) (see **Noteworthy**). Also, according to Department records, there have been more than 50 reported discharges from petroleum storage facilities in the planning unit. **Figure 3.3** shows permitted wastewater treatment facilities, landfills, and delineated ground water contamination areas in the planning unit.

Nonpoint Sources. Based on Level I and Level II land use summary information (SFWMD, 1995), the predominant land use in the C-25/Basin 1 planning unit is agriculture (approximately 65 percent of area). The agricultural lands are used for cultivation of citrus (approximately 34 percent of planning unit area) and improved pasture (approximately 28 percent of area). Only 5 percent of the planning unit area is designated as urban/built-up. These land uses can be associated with nonpoint discharges of pollutants and eroded sediments.

Ecological Summary

Approximately 10 percent of the planning unit area is defined as wetland and 15 percent listed as pine flatwoods. The largest contiguous wetland area, an extension of the St. Johns Marsh, is located in the northwestern corner of St. Lucie County. One state-managed natural area exists in the C-25/Basin 1 planning unit. The Green Swamp Preserve is located in the northwestern corner. Most waterbodies within this planning unit are agricultural canals used for drainage and/or irrigation that feed the conveyance system provided by C-25 and other SFWMD canals. Although classified as Class III waters, canals are not capable of supporting the diverse ecosystems characteristic of natural streams.

Information on Point Sources in Planning Units

Point sources contributing pollution to surface water or ground water originate from discrete, well-defined areas such as a facility discharge from the end of a pipe, a disposal well, or a wastewater sprayfield. Point sources generally fall into two major types: domestic wastewater sources (which consist of sewage from homes, businesses, and institutions) and industrial wastewater sources (which include wastewater, runoff, and leachate from industrial or commercial

storage, handling, or processing facilities). Landfills, hazardous waste sites, dry cleaning solvent cleanup program (DSCP) sites, petroleum facility discharges, and delineated ground water contamination areas are also considered point sources. These sites have the potential to leach contaminants into ground water and surface water, but the impacts are difficult to quantify.

A detailed assessment of water quality in the basins for the purpose of TMDL develop-

ment requires identification of the source(s) of waterbody impairment. As part of the status assessment, information was gathered on permitted facilities that discharge wastewater and landfills and other point sources. Domestic and industrial surface discharge facilities in the planning units are listed with their design flows in **Appendix D**. The landfills or solid waste facilities in the planning units are also listed in **Appendix D**.

Environmental Remediation

Environmental remediation activities cover a broad spectrum of cleanup programs. These include state-managed hazardous waste, dry cleaning, and petroleum cleanup programs; as well as the federal Superfund and Resource Conservation and Recovery Act (RCRA) programs. These programs are designed to remediate ground water and soil contamination that pose a threat to public health and the environment.

The NPL is a consolidated list of the uncontrolled hazardous waste sites that pose the greatest threat to public health or the environment. Sites are listed on the NPL upon completion of a preliminary assessment, site inspection, and hazardous ranking system evaluation to determine their potential for adverse impacts and priority for corrective action. The EPA Superfund program administers the cleanup of NPL sites.

The Department's state-funded cleanup program administers the cleanup of contaminated hazardous waste sites when enforcement action taken against a responsible party is unsuccessful or when no responsible party is identified.

Delineated Ground Water Contamination Areas

The Department's Delineation Program was established in response to the discovery of ground water contaminated by EDB, a soil fumigant used in 38 counties to control nematodes in citrus groves and row crops. The program now includes ground water contaminated by other pesticides, industrial solvents, and nutrients. The coverage of delineated areas in this program is not intended to include all sources of contaminated ground water in Florida. The Delineation Program is designed to ensure

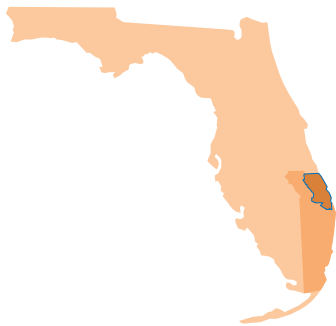
the protection of public health when consuming potable ground water supplies and to minimize the potential for cross-contamination of adjacent ground water resources.

The Delineation Program's primary responsibilities are to

- delineate areas of known ground water contamination;
- implement a water well construction permitting/application process that requires stringent water well construction standards; and
- require well water testing after

completion of the water well to ensure the potable quality of the water source.

Any newly constructed water wells in delineated areas, and existing water wells found to be contaminated, are remediated by installing individual water treatment systems or by connecting the users to public water supply systems.



Planning and Management Activities

The C-25/Basin 1 planning unit is primarily an agricultural area. Efforts to reduce pollutant loadings to stormwater from individual agricultural land holdings are tied to the active participation of local citrus growers and cattlemen in agricultural best management practices (BMP). These actions are assisted by DACS, IFAS, NRCS, and the Department.

Under the IRL South Feasibility Study, a regional water storage reservoir and a stormwater treatment area (STA) are proposed within this unit. This project will include a 741-acre aboveground reservoir and a 163-acre STA at the S-99 structure on the C-25 Canal. The system will be used to capture local runoff from the C-25 subbasin and the Ft. Pierce Farms WCD. The purpose of this component is to provide peak flow attenuation, a water supply for irrigation, and reductions in concentrations of nutrients, pesticides, and other contaminants. Water quality will be improved in the canal east of the STA and the southern IRL.

• North St. Lucie Planning Unit

General Description

The North St. Lucie planning unit is located in eastern St. Lucie County and includes Port St. Lucie and the western half of Ft. Pierce, the western part of Stuart, as well as Palm City, North River Shores, and Lighthouse Point. It extends from Ft. Pierce Inlet to the St. Lucie Inlet, westward to the C-24 Canal, and southward to below the confluence of the North and South Forks of the St. Lucie River. It includes the North Fork St. Lucie River, Tenmile Creek, Fivemile Creek, and the Savannas marshland. This planning unit approximates the area identified by SFWMD as the North Fork subbasin.

Once draining naturally into the IRL and the North Fork of the St. Lucie River, this watershed is now greatly modified by canals. This planning unit also includes the North St. Lucie Water Control District (NSLWCD), which is located in the northern part of the planning unit. Most of the drainage in NSLWCD is to the North St. Lucie River but a fraction is also to the C-25 and C-24 Canals. The eastern terminus of the C-24 Canal is located in this planning unit. Water from C-24 is released to the North Fork of the St. Lucie River via the C-23A Canal. **Figure 3.4** is a composite map of this planning unit that shows potentially impaired waters and potential point sources of pollution.

Water Quality Summary

Table 3.6 includes a summary of the water quality assessment status of all waterbody segments within the planning unit. Waterbodies represented by these data include the North Fork of the St. Lucie River and Estuary, Tenmile Creek, Fivemile Creek, and the Savannas.

Segments 3194 (North St. Lucie) and 3194B (St. Lucie) comprise estuarine waters of the North Fork of the St. Lucie River. Both are potentially impaired based on the IWR methodology (exceeding the Verified List screening criteria) and both are included on the 1998 303(d) list. According to the IWR, potential impairments for these segments include copper and DO (3194) and nutrients based on chlorophyll-*a* concentrations

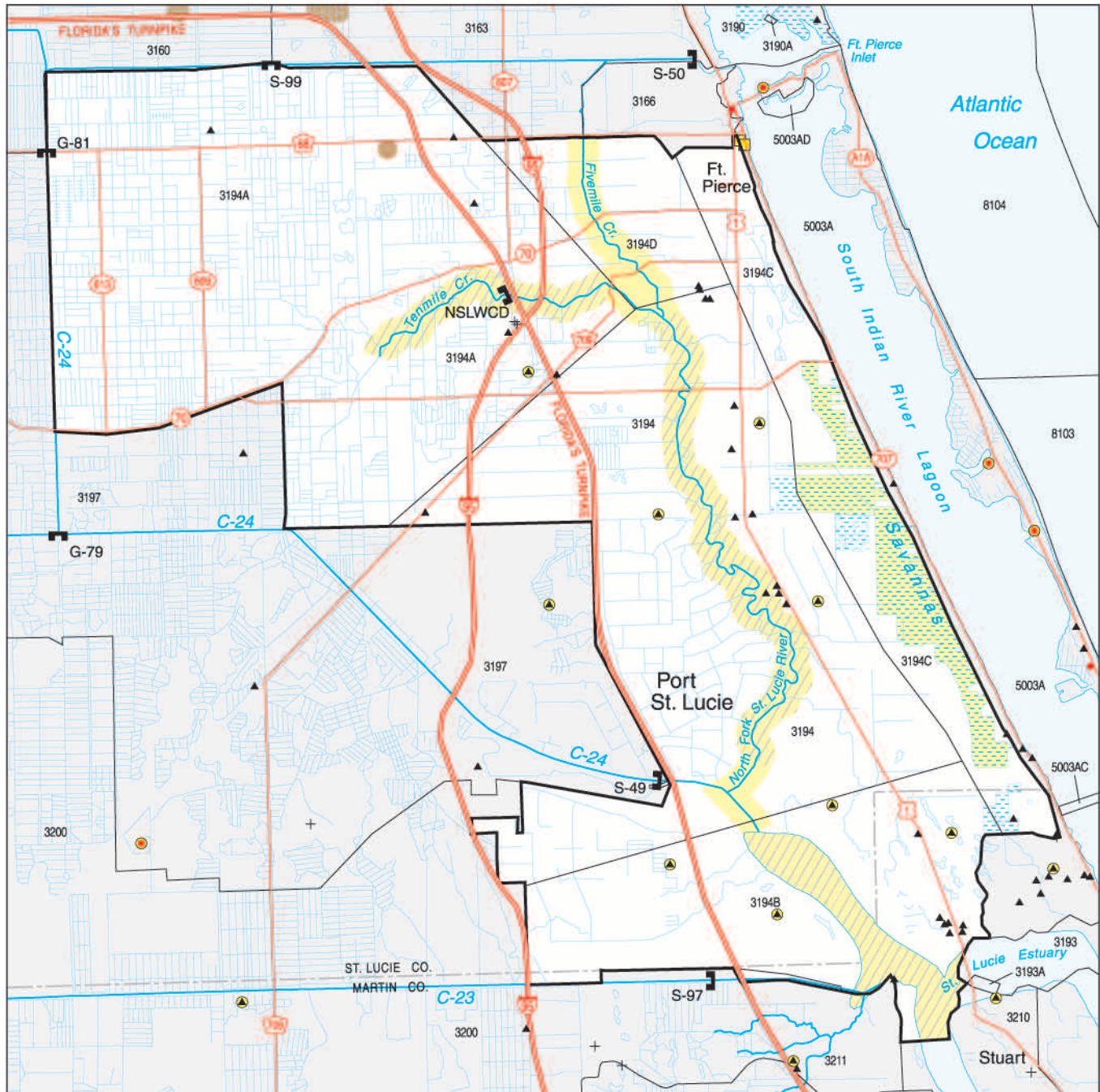
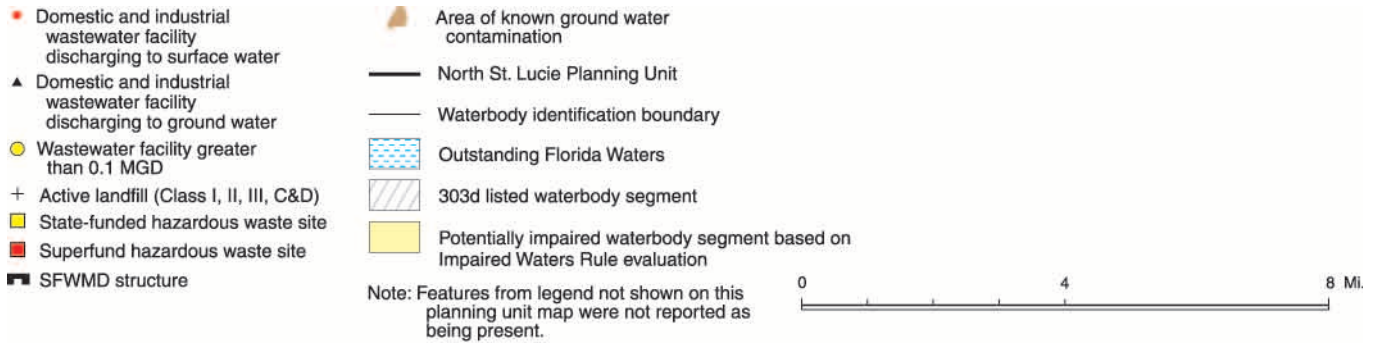


Figure 3.4: Composite Map of the North St. Lucie Planning Unit

Table 3.6: Integrated Water Quality Assessment Summary for the North St. Lucie Planning Unit

WBID	Waterbody Segment	Waterbody Type ¹	Class ²	1998 303(d) List Parameters of Concern	Data Evaluation per 2001 Impaired Surface Waters Rule Criteria		Integrated Assessment Category of WBID
					Parameters Potentially Impaired ³	Parameters Not Impaired	
3194	North St. Lucie	Estuary	3M	Coliform, Nutrients, Fish, DO	Copper, DO	N/A	3d Verified List
3194A	Tenmile Creek	Stream	3F	Coliform, Nutrients, BOD, DO	DO	Turbidity	3d Verified List
3194B	St. Lucie	Estuary	3M	Nutrients	Chlorophyll a	DO, Fecal Coliform, Total Coliform, Biology, Turbidity	3d Verified List
3194C	Savannas	Lake	3F	N/A	Biology, DO	Fecal Coliform, Tropic State Index, Turbidity, Unionized Ammonia	3d Verified List
3194D	Fivemile Creek	Stream	3F	N/A	DO	Biology, Turbidity	3c Planning List

Notes:¹The designation “stream” includes canals, rivers, and sloughs. The designation “lake” includes some marshes.²The state’s surface water classifications are as follows:

Class I: Potable water supplies

Class II: Shellfish propagation or harvesting

Class III: Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife

Class IV: Agricultural water supplies

Class V: Navigation, utility, and industrial use (there are no state waters currently in this class)

³Parameters in **bold** meet Verified List screening criteria

F = Fresh water

M = Marine

N/A = Not applicable, no parameters listed.

(3194B). Other evidence of impairment was gathered for the SLE segments in a Department SE District biological survey (Graves et al., June 2002). Sediment accumulation, decline of seagrasses and oysters, algal blooms, fish kills, and low diversity of benthic macroinvertebrates in the SLE in general and the mid to northern segments of the SLE in particular comprise this body of evidence.

Tenmile Creek (3194A) and Fivemile Creek (3194D) are potentially impaired, exceeding the Verified and Planning List criteria, respectively, for DO. Tenmile Creek is also potentially impaired for biology (Planning List criteria, **Appendix C**) and is on the 1998 303(d) list for coliform, nutrients, biochemical oxygen demand (BOD), and DO. The Savannas (3194C) was found by the IWR evaluation to be potentially impaired, exceeding Verified List criteria for biology.

To verify impairment of waterbodies based on exceedance of DO standards or biological indicators, causative pollutants need to be identified. Some DO exceedances may be related to total phosphorus.

Permitted Discharges and Land Uses

Point Sources. According to the Department database, there are 36 permitted wastewater treatment facilities in the North St. Lucie planning unit (26 domestic wastewater, 9 industrial wastewater, 1 other). None of these are permitted to discharge directly to surface water. The largest facility, the Martin County Utilities North domestic wastewater plant, has a design capacity of 1.2 mgd. There is 1 permitted solid waste landfill in the planning unit, the St. Lucie County Landfill, and 1 permitted construction and demolition (C&D) debris landfill. There are no state-funded or NPL hazardous waste sites, although there is 1 delineated ground water contamination area (for EDB). Also in this planning unit, there are 4 dry cleaning facilities in the DEP DSCP and more than 100 reported discharges from petroleum storage facilities. **Figure 3.4** shows permitted wastewater treatment facilities, landfills, and delineated areas in the North St. Lucie River planning unit.

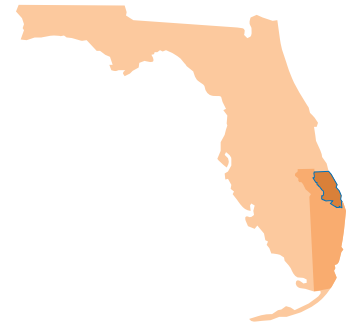
Nonpoint Sources. Runoff from urban and agricultural areas impacts water quality in the North Fork and its tributaries. Urban/built-up (35 percent of planning unit) and agriculture (also 35 percent of planning unit) are the predominant land uses. Low-density residential development makes up the largest percentage of urban land (13 percent of planning unit). Most of the urban development is in the eastern part of the planning unit. Citrus production areas in the western and northwestern parts of the planning unit comprise approximately 16 percent of the total planning unit area.

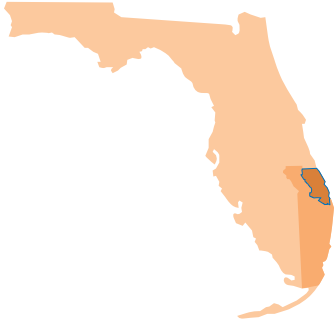
Ecological Summary

Approximately 14 percent of this planning unit has been identified as wetland and 12 percent as upland forests. The wetland areas are located primarily in two areas, along the North Fork of the St. Lucie River and in the Savannas wetland. The Savannas State Reserve is an Outstanding Florida Water (OFW) (**Figure 3.4**). All waters in this planning unit are designated as Class III, including canals.

Straightening and channelization have significantly modified the North Fork of the St. Lucie River, a state aquatic preserve. These modifications have reduced the river system's ability to filter sediment and attenuate nutrients and have dramatically reduced the wetlands that provide habitat. Sediment transported into the North Fork has been shown to be accumulating in abnormal quantities in the river bed (Gardner, 1984). The North Fork forms the upper segment of the SLE. Adverse ecological impacts to the estuary caused by the canal discharges of nutrients, sediment, and fresh water are well documented.

A water quality study on Tenmile Creek, the major tributary to the North Fork, identified significant concentrations of pesticides in the water (most notably malathion and ethion) that are apparently related to citrus farming in the Tenmile Creek Basin (Graves and Strom, June 1995).





Fish kills and the documentation of degraded biological communities in Tenmile Creek may be attributable to the pesticide load. Sedimentation in Tenmile Creek and the North Fork due to canal erosion in the NSLWCD has also been documented as a concern (NSLWCD, 2000).

Planning and Management Activities

A significant portion of this planning unit is in agricultural land use, primarily citrus production. Individual citrus growers are participating in the BMP program to reduce pollutant loadings to stormwater. Several programs supported by the St. Lucie River Issues Team are focused on reducing irrigation volumes that directly affect the volume of polluted runoff and the magnitude of transported sediment from irrigated citrus groves. In the Citrus Irrigation Conversion project supported by NRCS, cost-share-contributing growers in the North St. Lucie planning unit are converting to low-volume irrigation equipment to help reduce discharges.

Currently, stormwater transported by canals C-23 and C-24 enters directly into the North Fork St. Lucie River through tidal structures. The IRL South Feasibility Study includes the northern diversion component that will result in a significant improvement to the quality and better regulation of water discharged to the North Fork. Under this component, stormwater from the C-23 and C-24 Canals will be diverted into one of two reservoirs to be constructed in the along the eastern boundary of the C-24 and C-23 basins (C-23/24 North and South Reservoirs). Water from these reservoirs could be returned to the canals to equalize storage, to supply water, or to be diverted to the C-23/24 STA (2,300-acre), located in the northwestern part of this planning unit, where it would be treated. From the STA, the treated water would be routed via a bypass canal to Tenmile Creek and into the North Fork. The northern diversion component will improve the quality of water and the timing of fresh water being delivered to the North Fork and the SLE. Hydrologic models predict that it can come close to achieving predrainage distribution flows (quantity) to the North Fork.

The Feasibility Study also includes a significant project to restore the natural hydrology of the North Fork by reconnecting river floodplains and oxbows and returning the river to a condition similar to its historic path. The North Fork Floodplain Restoration component will increase the capacity of the river to accommodate flows and improve water quality and habitat. This component is also a St. Lucie River Issues Team project.

The North Fork Floodplain Restoration project is actually already underway. It was one of the numerous water quality improvement projects sponsored by the St. Lucie River Issues Team. Other Issues Team projects in this planning unit that are funded and underway include

- the Tenmile Creek Restoration (a Central and Southern Florida [C&SF] Ecosystem Restoration Critical Project that includes construction of a temporary/seasonal stormwater basin to provide treatment and flow equalization of water in Tenmile Creek);
- NSLR Canal Retrofits and NSLWCD Bank Restoration projects, under the Issues Team umbrella, addressing soil erosion and sediment transported by canals;

- the Platt's Creek restoration project that also provides treatment of water entering the North Fork in St. Lucie County; and
- several urban stormwater retrofit projects benefiting the North Fork and SLE.

• C-24 Planning Unit

General Description

The C-24 planning unit, comprising SFWMD's C-24 subbasin, includes an area that lies in St. Lucie County and also includes a small part of Okeechobee County on the western edge. The southern part of Port St. Lucie is located in this planning unit, which is west of the North St. Lucie planning unit. The C-24 planning unit is an area that under natural conditions would have had no direct connection to the estuary. However, the C-24 Canal now provides an outlet to the SLE. Agricultural canals control virtually all drainage within this planning unit. Through the S-49 structure, canal C-24 discharges water from the subbasin, as well as some water from the C-25 subbasin and the NSLWCD, to the North Fork of the St. Lucie River. **Figure 3.5** is a composite map of this planning unit that shows potentially impaired waters.

Water Quality Summary

Table 3.7 includes a summary of the water quality assessment status of the C-24 Canal, the only waterbody segment within the planning unit. According to the IWR evaluation, C-24 (3197) is potentially impaired for DO, which exceeds the Verified List screening criteria. However, as stated previously, the causative pollutant(s) responsible for DO standard exceedance must be identified for verification of the impairment. Data indicate that the causative pollutant may be total phosphorus. Recent monitoring data collected by the Department but not included in the preliminary assessment also indicate that this waterbody segment is potentially impaired for nutrients and copper. The C-24 Canal is also on the 1998 303(d) list for DO and for nutrients.

Permitted Discharges and Land Uses

Point Sources. This planning unit has few potential point sources. There are only 5 permitted wastewater treatment facilities in this planning unit, and only 1 of these discharges to surface water. A Florida Rock Industries mining/quarry operation has an industrial wastewater permit to discharge to surface water at a design flow rate of 26.65 mgd. The Department database indicates that there have been 10 reported discharges from petroleum storage facilities. There are no permitted solid waste landfills in this planning unit, but there is one closed C&D landfill. There are not any state or NPL hazardous waste cleanup sites or delineated ground water contamination areas. **Figure 3.5** shows the permitted wastewater treatment facilities.

Nonpoint Sources. An estimated 61 percent of this planning unit is used for agriculture. Most is in improved pasture (38 percent) followed by citrus production (15 percent). Urban/built-up land constitutes 11 percent of the planning unit, but most of that is listed as undeveloped open land.



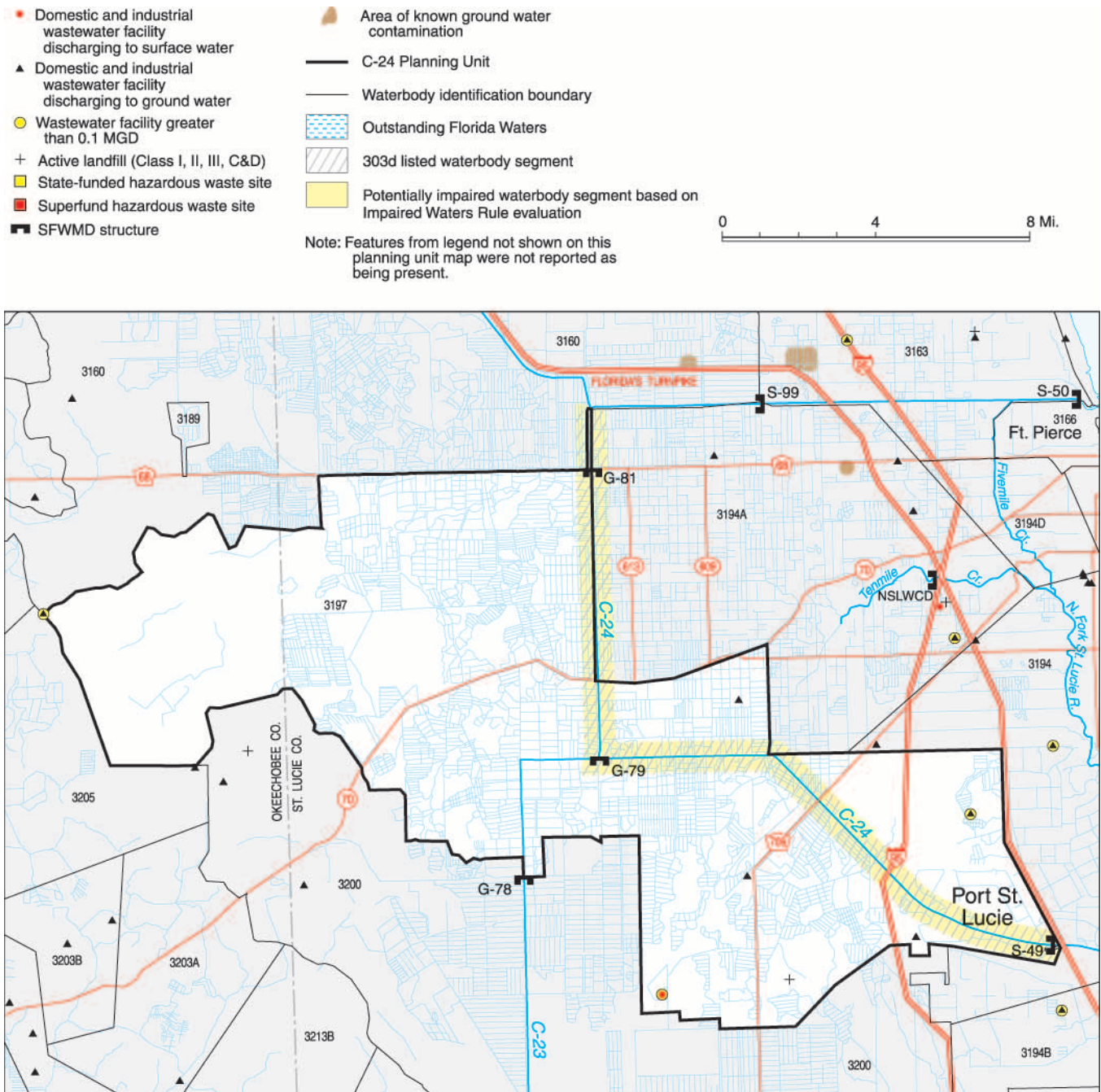


Figure 3.5: Composite Map of the C-24 Planning Unit

Table 3.7: Integrated Water Quality Assessment Summary for the C-24 Planning Unit

WBID	Waterbody Segment	Waterbody Type ¹	Class ²	1998 303(d) List Parameters of Concern	Data Evaluation per 2001 Impaired Surface Waters Rule Criteria		
					Parameters Potentially Impaired ³	Parameters Not Impaired	Integrated Assessment Category of WBID
3197	C-24	Stream	3F	Nutrients, DO	DO	Arsenic, Iron, Turbidity, Unionized Ammonia	3d Verified List

Notes:

¹The designation “stream” includes canals, rivers, and sloughs. The designation “lake” includes some marshes.

²The state’s surface water classifications are as follows:

Class I: Potable water supplies

Class II: Shellfish propagation or harvesting

Class III: Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife

Class IV: Agricultural water supplies

Class V: Navigation, utility, and industrial use (there are no state waters currently in this class)

³Parameters in **bold** meet Verified List screening criteria

F = Fresh water

M = Marine

N/A = Not applicable, no parameters listed.

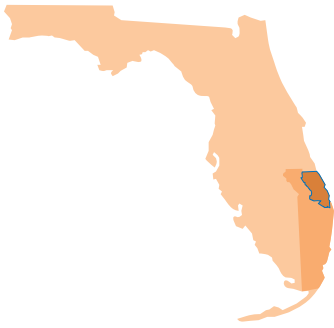
There are no significant population centers except for the portion of Port St. Lucie that exists in the extreme eastern part of the planning unit.

Ecological Summary

Approximately 17 percent of the C-24 planning unit is identified as wetland and 8 percent as upland forest. The largest wetland area is in the extreme western part of the planning unit in Okeechobee County and is associated with Cypress Creek. Almost all waterbodies within this planning unit are agricultural canals that feed into the conveyance system provided by the C-24 and C-23 Canals. These canals are not capable of supporting the diverse ecosystems characteristic of natural streams.

Planning and Management Activities

Proposed activities under the IRL South Feasibility Study in the C-24 and C-23 planning units include construction of reservoirs for stormwater storage, redirection, and equalization of flow within the two canals. These features will be constructed along the eastern boundaries of these planning units. The C-24 planning unit will also include construction of one of three Natural Storage and Water Quality Treatment Areas that will provide alternative aboveground storage of water, rehydration of former wetlands, creation of habitat, and water quality improvements. These natural area components include acquisition of large tracts of land, plugging of existing secondary drainage ditches to disconnect drainage from the C&SF system canals, and reestablishment of wetland areas that will store water and reduce nutrient loads to the receiving waters. The C-24 basin includes part



of the 32,639-acre Cypress Creek Complex within its western boundary. This land is presently used for improved pasture.

Because agriculture is the primary land use within this planning unit, implementation of effective BMPs to reduce stormwater pollution from cow-calf ranches and citrus groves are critical to the improvement of water quality.

• C-23 Planning Unit

General Description

The C-23 planning unit, approximating SFWMD's C-23 subbasin, includes an area that lies in both southern St. Lucie County and northern Martin County and includes a small part of Okeechobee County on the western edge. There are no significant population centers in this planning unit. The C-23 subbasin is located south of C-24. Agricultural drainage canals in this planning unit discharge to C-23 and this flow is discharged to the IRL via the North Fork of the St. Lucie River. Discharge from the C-23 subbasin is controlled by the S-97 structure. **Figure 3.6** is a composite map of this planning unit that shows potentially impaired waters and potential point sources of pollution.

Water Quality Summary

Table 3.8 includes a summary of the water quality assessment status of the C-23 Canal, the only waterbody segment within the planning unit. According to the IWR evaluation, C-23 (3200) is potentially impaired for mercury and DO. The evaluation indicates that DO exceeds the Verified List screening criteria. Verification of the causative pollutant responsible for the DO exceedance (possibly total phosphorus) will be necessary. In addition, recent monitoring by the Department (not represented by the preliminary assessment) indicates that C-23 is also potentially impaired for nutrients based on chlorophyll-*a* detections.

Permitted Discharges and Land Uses

Point Sources. There are five permitted wastewater treatment facilities in this planning unit, none of which discharge to surface water. The database also includes one facility (Turnpike Dairy, Inc.) that discharges to surface water. The largest wastewater treatment facility is the Martin Correctional Institute domestic wastewater treatment plant, which has a design capacity of 0.6 mgd. There are three permitted solid waste landfills in this planning unit, the Okeechobee Landfill Inc. Class I landfill and the Martin County-Palm City II, Class I and Class III landfills. There are six reported discharges from petroleum storage facilities. There are no other permitted point sources, state or NPL hazardous waste sites, or delineated areas in this planning unit. **Figure 3.6** showed permitted wastewater treatment facilities and landfills in the C-23 planning unit.

Nonpoint Sources. Agriculture is the primary land use in this planning unit, occurring in approximately 64 percent of the total area. Most land is in improved pasture (38 percent of the area), followed by citrus production (26 percent of the planning unit). Approximately 2 percent of the C-23 planning unit is in the urban/built-up land use category.

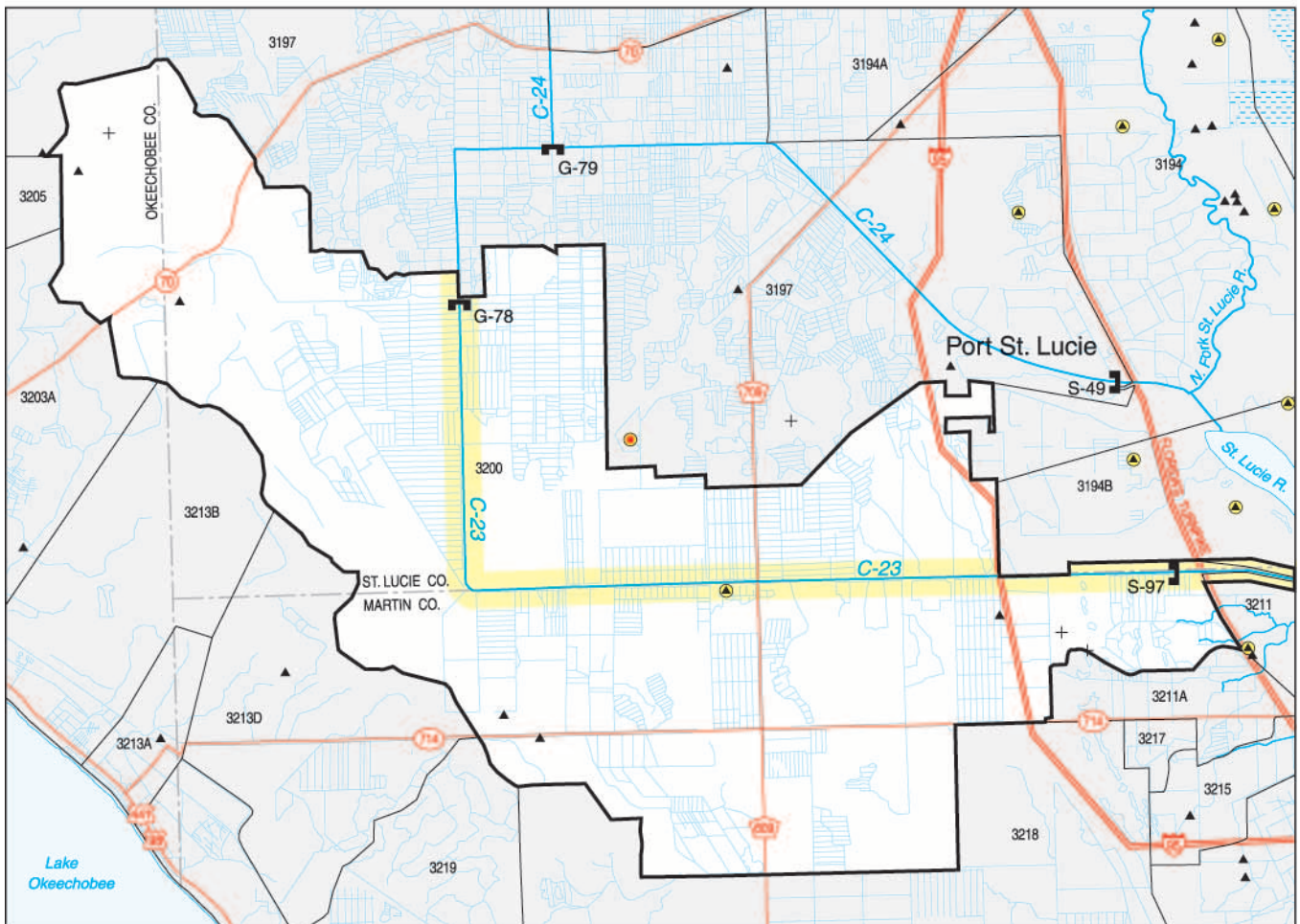
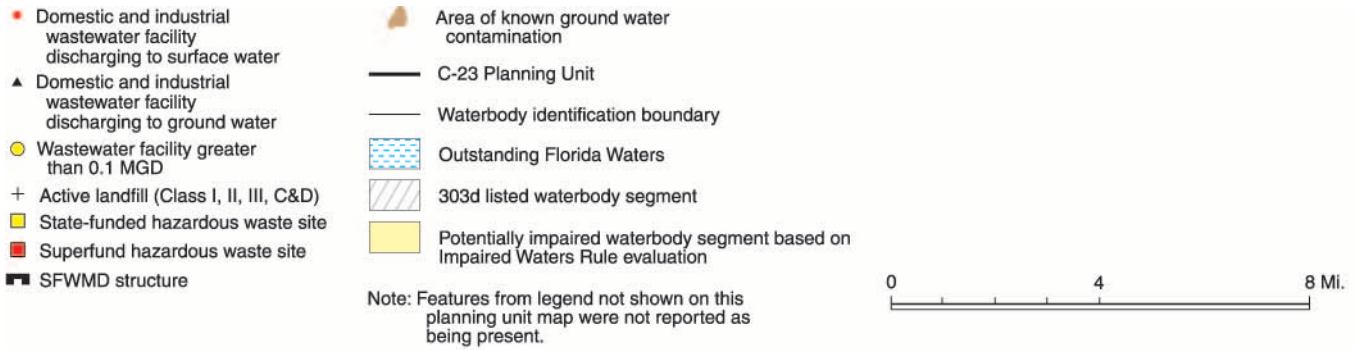


Figure 3.6: Composite Map of the C-23 Planning Unit

Table 3.8: Integrated Water Quality Assessment Summary for the C-23 Planning Unit

WBID	Waterbody Segment	Waterbody Type ¹	Class ²	1998 303(d) List Parameters of Concern	Data Evaluation per 2001 Impaired Surface Waters Rule Criteria		Integrated Assessment Category of WBID
					Parameters Potentially Impaired ³	Parameters Not Impaired	
3200	C-23	Stream	3F	N/A	DO , Mercury	Arsenic, Iron, Turbidity, Unionized Ammonia	3d Verified List

Notes:

¹The designation “stream” includes canals, rivers, and sloughs. The designation “lake” includes some marshes.

²The state’s surface water classifications are as follows:

Class I: Potable water supplies

Class II: Shellfish propagation or harvesting

Class III: Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife

Class IV: Agricultural water supplies

Class V: Navigation, utility, and industrial use (there are no state waters currently in this class)

³Parameters in **bold** meet Verified List screening criteria

F = Fresh water

M = Marine

N/A = Not applicable, no parameters listed.

Ecological Summary

Wetlands comprise approximately 24 percent of the planning unit area. Most are associated with Allapattah Flats, an area that naturally existed as flatwoods interspersed with depression marshes and wet prairies. Drainage and conversion to improved pasture have altered much of the natural Allapattah Flats area. Most waterbodies within this planning unit are agricultural canals used for drainage and/or irrigation that feed the conveyance system provided by C-23. Canals are often not capable of supporting the diverse ecosystems characteristic of natural streams.

Planning and Management Activities

As described above for the C-24 planning unit, the Feasibility Study proposed activities include construction of the C-23/24 reservoirs for stormwater storage, redirection, and equalization of flow within the two canals. The C-24 planning unit will also include the southern part of the Cypress Creek Natural Storage and Water Quality Treatment Area and the 40,048-acre Allapattah Complex in the southern part of the planning unit. Most of the land to be converted to these natural storage and treatment areas is presently improved pasture.

In the southwestern part of this planning unit, the CERP activities include construction of the 2,300-acre C-23/C-44 STA and diversion canal that comprise the southern diversion component. The project allows treatment of excess stormwater that would otherwise be discharged to the St. Lucie River via C-23. A diversion canal will be used to pump water into the STA from the C-23 Canal. After treatment, the water will be discharged via the southern portion of the diversion canal to the C-44 Canal.

Because agriculture is the primary land use within this planning unit, implementation of effective BMPs to reduce stormwater pollution from cow-calf operations and citrus groves are critical to the improvement of water quality.

- **South St. Lucie Planning Unit**

General Description

The South St. Lucie planning unit lies in Martin County and includes most of Stuart (in the southeastern part), plus portions of Palm City, Coral Gardens, Gomez, and Hobe Sound. This planning unit includes the natural drainage of the South St. Lucie River and includes several SFWMD subbasins. These include the Tidal St. Lucie subbasin (which includes the South Fork of the SLE, Manatee Creek Basin (Basin 2), Bessey Creek drainage (Basins 4 and 5), and Danforth Creek (Basin 6). It also includes the eastern terminus of canal C-44 (St. Lucie Canal) through which flow is regulated by the S-80 structure. **Figure 3.7** is a composite map of this planning unit that shows potentially impaired waters and potential point sources of pollution.

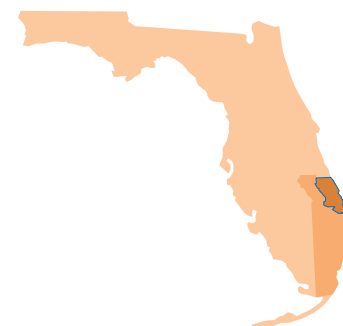
Water Quality Summary

Table 3.9 includes a summary of the water quality assessment status of all waterbody segments within the planning unit. These include the South Fork of the SLE, Bessey Creek, the nonestuarine South Fork, as well as Basins 6, 5, and 2.

Tidal St. Lucie (3210) and St. Lucie Canal below the S-80 structure (3210A) are estuarine segments that represent the South Fork of the SLE. According to the IWR, both are potentially impaired, Tidal St. Lucie for an imbalance of flora and fauna (per Chapter 62-303 “narrative criteria”) and St. Lucie Canal for DO. As previously discussed, information provided by Graves and others (June 2002) presents a convincing argument that potential impairments exist within all SLE segments. Department data recently collected and not included in the preliminary assessment indicate that 3210 may be found impaired based on nutrients (chlorophyll *a*) and copper. The St. Lucie Canal segment (3210A) is also on the 1998 303(d) list for coliform, nutrients, BOD, total suspended solids (TSS), and DO.

Another estuarine waterbody segment, Bessey Creek (3211), is a tributary to the SLE and is also potentially impaired. This segment of Bessey Creek exceeds the Planning List criteria for DO per the IWR and is also on the 1998 303(d) list for coliform, nutrients, BOD, and DO. Recent Department monitoring data not included in the preliminary assessment indicate that 3211 is also potentially impaired for nutrients based on chlorophyll-*a* detections. Another segment of Bessey Creek (3211A) does not have sufficient data to be assessed.

There are four freshwater stream segments in the planning unit that were evaluated, South Fork of the St. Lucie River south of the estuary (3210B), Basin 6 (3215), Basin 5 (3217), and Basin 2 (3220). The South Fork segment is potentially impaired, exceeding the Verified List criteria



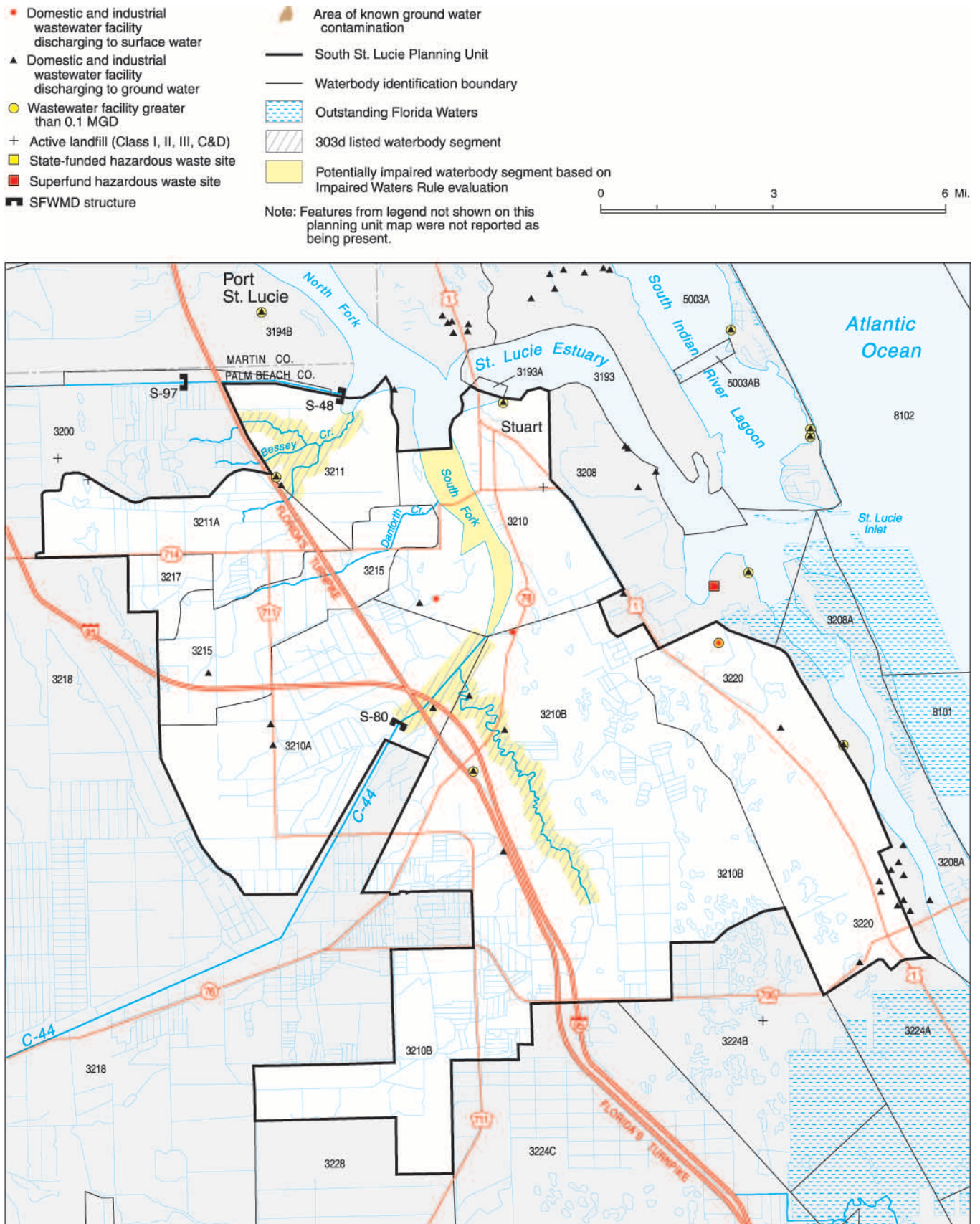


Figure 3.7: Composite Map of the South St. Lucie Planning Unit

Table 3.9: Integrated Water Quality Assessment Summary for the South St. Lucie Planning Unit

WBID	Waterbody Segment	Waterbody Type ¹	Class ²	1998 303(d) List Parameters of Concern	Data Evaluation per 2001 Impaired Surface Waters Rule Criteria		
					Parameters Potentially Impaired ³	Parameters Not Impaired	Integrated Assessment Category of WBID
3210	Tidal St. Lucie	Estuary	3M	N/A	Imbalance of Flora and Fauna	DO, Turbidity	3c Planning List
3210A	St. Lucie Canal	Estuary	3M	Nutrients, DO	DO	Turbidity	3c Planning List
3210B	South Fork St. Lucie	Stream	3F	Coliform, Nutrients, BOD, TSS, DO	Biology, DO	Fecal Coliform, Turbidity, Unionized Ammonia	3d Verified List
3211	Bessey Creek	Estuary	3M	Coliform, Nutrients, BOD, DO	DO	N/A	3c Planning List
3211A	Bessey Creek	Estuary	3F	N/A	N/A	N/A	3b Not Enough Data
3215	Basin 6	Stream	3F	N/A	N/A	N/A	3a No Data
3217	Basin 5	Stream	3F	N/A	N/A	N/A	3a No Data
3220	Basin 2	Stream	3F	N/A	N/A	N/A	3b Not Enough Data

Notes:

¹The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.

²The state's surface water classifications are as follows:

Class I: Potable water supplies

Class II: Shellfish propagation or harvesting

Class III: Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife

Class IV: Agricultural water supplies

Class V: Navigation, utility, and industrial use (there are no state waters currently in this class)

³Parameters in **bold** meet Verified List screening criteria

F = Fresh water

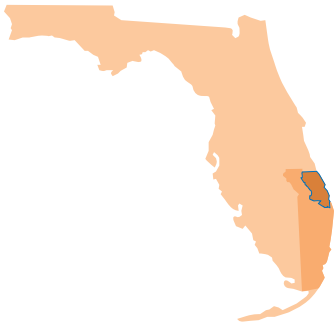
M = Marine

N/A = Not applicable, no parameters listed.

for biology and for DO. It is also on the 1998 303(d) list for a variety of parameters including coliform, nutrients, BOD, and DO. Basins 6, 5, and 2 (3220) do not have sufficient data to be assessed.

Permitted Discharges and Land Uses

Point Sources. In this planning unit, there are 19 permitted wastewater treatment facilities, 11 treating domestic wastewater, and 8 treating industrial wastewater. Only 3 of these facilities discharge to surface water. The Martin County Utilities (MCU) Consolidated Reuse System (South County) in Port Salerno is a wastewater reclamation/reuse facility and is only allowed to discharge intermittently during periods of heavy



Benthic

Occurring at the bottom of a body of water.

rainfall under its NPDES permit. The MCU Martin Downs Wastewater Treatment Facility in Palm City, included under the MCU permit, has a design capacity of 2 mgd but does not discharge to surface water. There are 2 closed solid waste landfills in this planning unit. According to Department records, in the South St. Lucie planning unit, there are 8 dry cleaning facilities in the DSCP and approximately 90 reported discharges from petroleum facilities. There are not any state or NPL hazardous waste cleanup sites or delineated ground water contamination areas in this planning unit. **Figure 3.7** shows permitted wastewater treatment facilities and landfills in the South St. Lucie River planning unit.

Nonpoint Sources. Predominant land uses in the South St. Lucie planning unit are agriculture (34 percent) and urban/built-up (26 percent). The primary agricultural land use is improved pasture (25 percent of planning unit). The predominant land use within the urban/built-up category is low-density residential (approximately 10 percent).

Ecological Summary

Wetlands comprise approximately 10 percent of this planning unit and upland forests cover approximately 25 percent of the area. The South Fork of the St. Lucie River and the Atlantic Ridge (in the southern part of this planning unit) are designated as a Save Our Rivers (SOR) priority natural areas for acquisition.

It is through the C-44 Canal discharge into the South Fork of the St. Lucie River that many of the ecological impacts to the SLE have been felt. The massive surges of fresh water have severely stressed the entire ecosystem of the estuary, dramatically reducing the salinity level at times. The sediment load carried by C-44 has blanketed the bottoms of the estuary, the river, and its tributaries and depleted the natural **benthic** habitat. Urban and agricultural canals that discharge to the estuary are in some respects equally to blame for the decline in the estuary (St. Lucie River Issues Team Report, October 1998).

Planning and Management Activities

Under the Feasibility Study, approximately 17,143 acres of pastureland in the Pal-Mar tract will be converted to a Natural Storage and Treatment Area. This area is in both the South St. Lucie (Tidal St. Lucie) and C-44 planning units. By plugging canals that would otherwise discharge directly to C-44 and the South Fork and by taking land out of agricultural land use, this component will improve water quality and reduce the sediment load to the river and estuary.

Issues Team plans include three significant urban stormwater retrofit projects underway in the Stuart area. These include the Poppleton Creek, Fern Creek, and Frazier Creek projects that incorporate detention and treatment of urban stormwater before it reaches the St. Lucie River and the estuary.

Approximately 25 percent of this planning unit is used for agricultural purposes, primarily in improved pastureland. Like elsewhere, implementation of BMPs to reduce polluted runoff from cow-calf operations are important to the improvement of water quality in the receiving waterbodies.

- C-44 Planning Unit

General Description

This planning unit includes most of the drainage basin of the C-44 Canal and approximates SFWMD's C-44 subbasin. The C-44 Canal, also known as the St. Lucie Canal, St. Lucie Waterway, and Okeechobee Waterway, is the navigational route between the east coast and Lake Okeechobee and directly connects Lake Okeechobee to the South Fork of the St. Lucie River. The C-44 Canal and secondary agricultural drainage canals are the most prominent surface water features in this subbasin, but there are also many natural, poorly drained wetlands interspersed. The S-308 structure controls flow from Lake Okeechobee into C-44. This planning unit includes the towns of Indiantown and Bessemer, and includes one water control district, the Troup-Indiantown Drainage District. **Figure 3.8** is a composite map of this planning unit.

Water Quality Summary

The C-44 planning unit comprises only one waterbody segment (WBID 3218, the C-44 Canal itself) and this segment is not included on the 1998 303(d) list of impaired waterbodies. Water quality summary data are provided in **Table 3.10**. The C-44 Canal is potentially impaired for DO and mercury per the IWR. The causative pollutant for the DO standard exceedance (potentially total phosphorus) needs to be confirmed to verify the impairment.

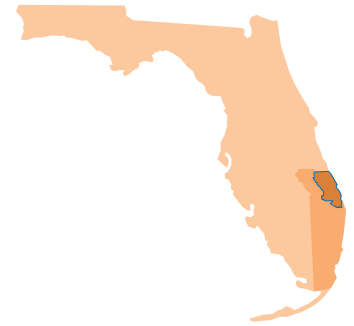
Permitted Discharges and Land Uses

Point Sources. There are 6 permitted wastewater treatment facilities in the C-44 planning unit, all are located in Indiantown. The largest, the Indiantown Company domestic wastewater treatment facility has a design capacity of 1 mgd and discharges to percolation ponds and a restricted access irrigation site. There is 1 inactive permitted solid waste landfill, in Indiantown. In this planning unit there is 1 NPL site, the Florida Steel Company site in Indiantown. There are approximately 50 reported discharges from petroleum facilities in the C-44 planning unit. There are no delineated areas. **Figure 3.8** includes permitted wastewater treatment facilities, landfills, and the NPL site in the C-44 planning unit.

Nonpoint Sources. Over 63 percent of this planning unit is used for agricultural purposes. Citrus production occurs in approximately 32 percent of the planning unit and approximately 25 percent is in improved pasture (presumably for beef cattle production). Urban/built-up land uses occupy less than 2 percent of the C-44 planning unit.

Ecological Summary

Most waterbodies within this planning unit are agricultural canals used for drainage and/or irrigation that feed the conveyance system provided by C-44. C-44 also transports water from Lake Okeechobee eastward to the SLE. The canals in this planning unit may not be capable of supporting the diverse ecosystems characteristic of natural streams. Approximately 21 percent of the C-44 planning unit was identified as wetland. This includes part of the most extensive functional wetland in the region. The 32,000-



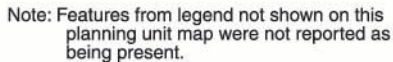


Figure 3.8: Composite Map of the C-44 Planning Unit

Table 3.10: Integrated Water Quality Assessment Summary for the C-44 Planning Unit

WBID	Waterbody Segment	Waterbody Type ¹	Class ²	1998 303(d) List Parameters of Concern	Data Evaluation per 2001 Impaired Surface Waters Rule Criteria		Integrated Assessment Category of WBID
					Parameters Potentially Impaired ³	Parameters Not Impaired	
3218	C-44	Stream	3F	N/A	DO, Mercury, Turbidity		3d Verified List

Notes:

¹The designation “stream” includes canals, rivers, and sloughs. The designation “lake” includes some marshes.

²The state’s surface water classifications are as follows:

Class I: Potable water supplies

Class II: Shellfish propagation or harvesting

Class III: Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wild-life

Class IV: Agricultural water supplies

Class V: Navigation, utility, and industrial use (there are no state waters currently in this class)

³Parameters in **bold** meet Verified List screening criteria

F = Fresh water

M = Marine

N/A = Not applicable, no parameters listed.

acre Pal-Mar tract, straddling northern Palm Beach and southern Martin Counties, remains in private ownership but has been much sought after as a public lands acquisition.

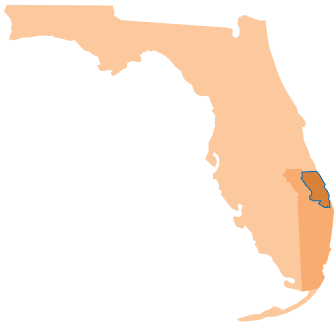
Planning and Management Activities

The C-44 planning unit includes four components of the IRL South Feasibility Study’s recommended plan. These components include the C-44 West Reservoir and Stormwater Treatment Area, the C-44 East Stormwater Treatment Area, and Pal-Mar Natural Storage and Water Quality Treatment Area.

The C-44 West Reservoir and Stormwater Treatment Area are located outside of the western boundary of the planning unit near Lake Okeechobee. The component includes a 3,901-acre reservoir and a 2,575-acre STA that will provide storage and treatment of water flowing from and to Lake Okeechobee in the C-44 Canal. The reservoir will be used to detain stormwater originating in the C-44 basin to reduce the freshwater flow rate and volume discharged to the estuary during storm events. Water collected in the reservoir will be directed to the STA for treatment prior to being released to Lake Okeechobee or the C-44 Canal.

The 2,222-acre C-44 East Stormwater Treatment Area will be located at the eastern end of C-44 at the S-80 structure and will provide treatment of C-44 basin waters being released to the South Fork of the St. Lucie River via S-80.

As described in the South St. Lucie discussion, the Pal-Mar component includes approximately 17,143 acres of pastureland in the Pal-Mar tract that would be converted to a Natural Storage and Treatment Area. This area is in both the South St. Lucie (Tidal St. Lucie) and C-44 planning



units. By plugging canals that would otherwise discharge directly to C-44 and the South Fork and by taking land out of agricultural land use, this component will improve water quality and reduce the sediment load to the river and estuary.

• Loxahatchee Planning Unit

General Description

This planning unit includes the Loxahatchee River and its tributaries. The area includes land in both Martin and Palm Beach Counties. Parts of Jupiter and Tequesta are located in the southeastern part of the planning unit and the northern extremities of Palm Beach Gardens are located in the southern edge of the Loxahatchee planning unit. This planning unit also contains part of four Chapter 298 water control districts: Pal-Mar WCD, Hobe-St. Lucie Conservancy District, South Indian River WCD, and part of the North Palm Beach Improvement District. The three main tributaries in the Loxahatchee Basin are the Northwest Fork, the North Fork, and the Southwest Fork. These main tributaries drain to the central embayment (estuary) that in turn is connected to the Atlantic Ocean at Jupiter Inlet. The planning unit is divided by SFWMD into six basins. These include the following:

- Jonathan Dickinson (including the northeastern portion of the planning unit and watersheds for the North Fork and Kitching Creek);
- the estuary;
- C-18 Canal/Corbett Wildlife Management Area (WMA) (including the C-18 Canal that drains the J.W. Corbett Wildlife Management Area and remnants of the Loxahatchee Slough to the south);
- Cypress Creek/Pal-Mar (including the Cypress Creek drainage and Pal-Mar wetland area in the northwestern part of the watershed);
- The Groves (a predominantly agricultural area in the north central part of the planning unit); and
- Wild and Scenic River/Jupiter Farms (an area that includes an intensively drained upstream portion of the Northwest Fork and a downstream “wild and scenic” portion).

Figure 3.9 is a composite map of this planning unit that indicates potentially impaired waters and potential point sources of pollution. The waterbody segments used in this assessment (as shown in **Figure 3.9**) do not entirely correspond with the Loxahatchee River watershed subbasins defined by SFWMD that are described above.

Water Quality Summary

Table 3.11 includes a water quality assessment summary for waterbody segments in this planning unit. Segments included are the estuarine and freshwater portions of the Loxahatchee River, tributaries within the Kitching Creek and Cypress Creek subbasins, drainage from the Jupiter Farms and Pal-Mar areas, and the C-18 Canal.

This assessment has subdivided the Loxahatchee River Estuary into four waterbody segments. The lower estuary (Loxahatchee River, 3226D)

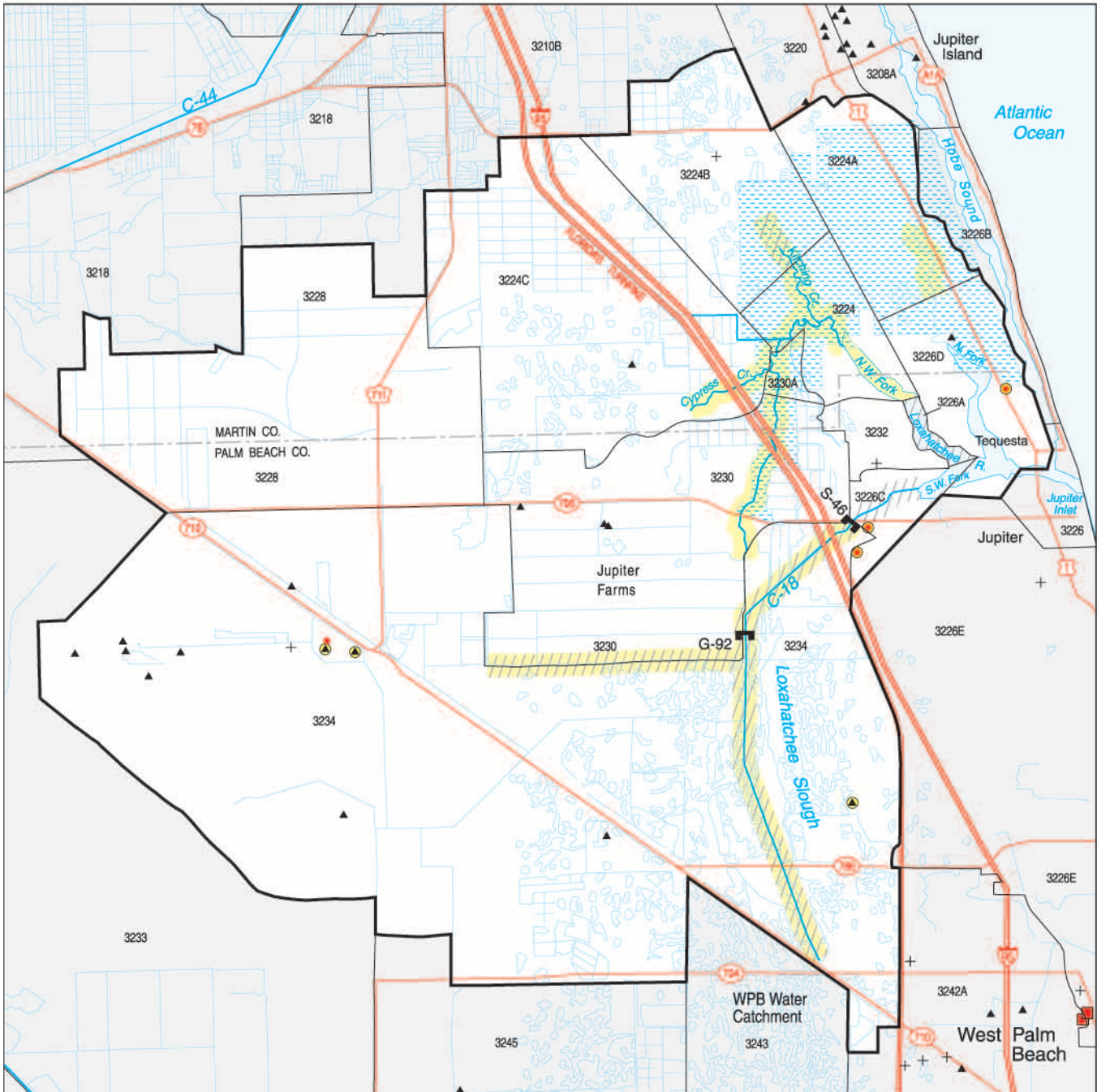
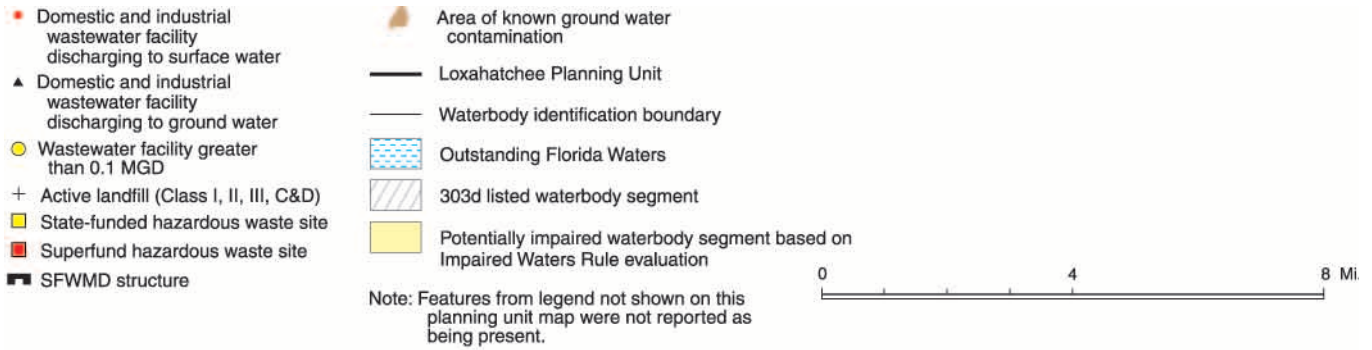


Figure 3.9: Composite Map of the Loxahatchee Planning Unit

Table 3.11: Integrated Water Quality Assessment Summary for the Loxahatchee Planning Unit

WBID	Waterbody Segment	Water-body Type ¹	Class ²	1998 303(d) List Parameters of Concern	Data Evaluation per 2001 Impaired Surface Waters Rule Criteria		Integrated Assessment Category of WBID
					Parameters Potentially Impaired ³	Parameters Not Impaired	
3224	Jonathan Dickinson	Estuary	3M	N/A	DO	Chlorophyll <i>a</i> , Fecal Coliform, Total Coliform, Turbidity	3c Planning List
3224A	North Fork Loxahatchee	Stream	3F	N/A	DO	Biology, Chlorophyll <i>a</i> , Fecal Coliform	3d Verified List
3224B	Kitching Creek	Stream	3F	Coliform, Nutrients, BOD, DO	Biology, DO	N/A	3d Verified List
3224C	Cypress Creek	Stream	3F	N/A	DO	Chlorophyll <i>a</i> , Fecal Coliform, Turbidity, Unionized Ammonia	3d Verified List
3226A	NW Fork Loxahatchee	Estuary	3M	Nutrients, DO	N/A	DO, Turbidity, Unionized Ammonia	2 Meets Some Uses
3226C	SW Fork Loxahatchee	Estuary	3M	Coliform, Nutrients, DO	N/A	Chlorophyll <i>a</i> , DO, Fecal Coliform, Total Coliform, Turbidity	2 Meets Some Uses
3226D	Loxahatchee River	Estuary	3M	N/A	N/A	Chlorophyll <i>a</i> , DO, Fecal Coliform, Total Coliform, Turbidity	2 Meets Some Uses
3232	Loxahatchee River	Stream	3F	Nonpoint Sources (Narrative)	N/A	N/A	3a No Data
3230	Floodplain/Jupiter Farms	Stream	3F	N/A	Biology, DO	Chlorophyll <i>a</i> , Fecal Coliform, Total Coliform, Turbidity, Unionized Ammonia	3d Verified List
3228	Pal-Mar	Stream	3F	N/A	N/A	N/A	3a No Data
3230A	NW Fork Loxahatchee	Stream	3F	N/A	DO	Fecal Coliform, Turbidity, Unionized Ammonia	3d Verified List
3234	C-18	Stream	1	Coliform, Fish, DO	Biology, DO, Fish, Mercury, Total Coliform	Arsenic, Fecal Coliform, Iron, Nitrate, Turbidity, Unionized Ammonia	3d Verified List

Notes

¹The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.

²The state's surface water classifications are as follows:

Class I: Potable water supplies

Class II: Shellfish propagation or harvesting

Class III: Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife

Class IV: Agricultural water supplies

Class V: Navigation, utility, and industrial use (there are no state waters currently in this class)

³Parameters in **bold** meet Verified List screening criteria

F = Fresh water

M = Marine

N/A = Not applicable, no parameters listed.

and the Southwest Fork (3226C) had sufficient data to indicate attainment of some of their designated uses. There are two segments that represent the estuarine portion of the Northwest Fork of the river, NW Fork Loxahatchee (3226A) and the estuarine portion of the river within Jonathan Dickinson State Park (3224). Segment 3226A also meets some

of its designated uses, but is on the 1998 303(d) list for nutrients and DO. Segment 3224 is potentially impaired for DO, exceeding the Planning List screening criteria.

Low DO also causes potential impairment of several of the freshwater segments. These include the freshwater portion of the Northwest Fork (within NW Fork Loxahatchee [3230A] and Floodplain/Jupiter Farms [3230]), Cypress Creek (3224C), North Fork (3224A), Kitching Creek (3224B), and canals draining the Floodplain/Jupiter Farms segment (3230). The latter two waterbody segments are also potentially impaired for biology, with Kitching Creek also on the 1998 303(d) list for several parameters. The Pal-Mar waterbody segment (3228) also has no monitoring data and was not evaluated.

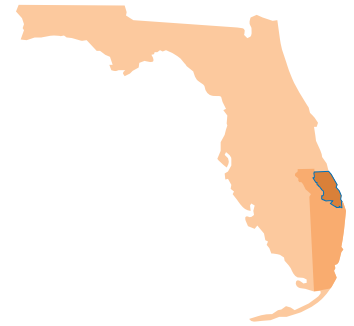
One waterbody segment (Loxahatchee River, 3232) is a small area that drains directly to the river and has no monitoring data, probably because it contains no distinct waterbodies.

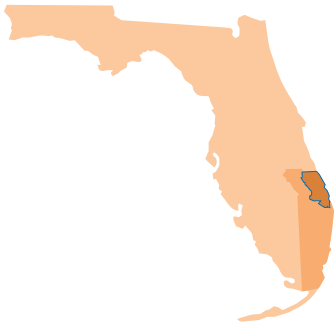
The C-18 Canal (3234), a Class 1 waterbody, is potentially impaired for biology, DO, mercury, total coliform, and fish consumption advisory. For some parameters, it exceeds the Verified List screening criteria. As stated previously, potential impairments for DO and biology must be associated with causative pollutants, and will require further evaluation.

Permitted Discharges and Land Uses

Point Sources. There are 23 permitted wastewater treatment facilities in this planning unit. These include 13 domestic, 9 industrial, and 1 underground injection facilities. There are 4 wastewater treatment facilities that discharge to surface water and they are the more significant discharges in the planning unit. They include Seacoast's PGA domestic wastewater treatment facility (12 mgd), the Loxahatchee River District's domestic wastewater plant (9 mgd), the Jupiter Water Treatment Plant Reverse Osmosis discharge (design capacity of 2 mgd), and the Village of Tequesta Water Treatment Plant Reverse Osmosis discharge (1.3 mgd). In this planning unit, records show that there are 4 permitted solid waste landfills (2 are reported as active). There are 8 DSCP program dry cleaning facilities and more than 100 reported discharges from petroleum storage facilities in this planning unit. There are no state or NPL hazardous waste cleanup sites or delineated ground water contamination areas. **Figure 3.9** shows permitted wastewater treatment facilities and landfills in the Loxahatchee planning unit.

Nonpoint Sources. Wetland is the predominant land cover in this planning unit, covering more than 57 percent of the land area. Urban/built-up land uses occur over 21 percent of the area and agricultural practices occur on approximately 14 percent of the planning unit. Population centers include the northern extremities of Jupiter and Palm Beach Gardens. The main agricultural land use is improved pasture, most of which occurs in the Cypress Creek and Jupiter Farms areas. However, there is also an area of citrus production (The Groves) in the north central part of the basin.





Ecological Summary

As mentioned above, approximately 57 percent of the Loxahatchee planning unit is wetlands. The largest intact wetland areas occur in the western part of the C-18/J.W. Corbett subbasin, remnants of the Loxahatchee Slough, and part of the Pal-Mar tract.

The Northwest Fork of the Loxahatchee is Florida's first federally designated Wild and Scenic River. The watershed includes a number of natural areas that are essentially intact and in public ownership or being considered for acquisition. These include the J.W. Corbett Wildlife Management area, Jonathan Dickinson State Park, Beeline Natural Areas, Juno Hills Natural Area, Loxahatchee Slough, Pal-Mar, and the Atlantic Coastal Ridge. The waters within Jonathan Dickinson State Park are classified as OFWs (**Figure 3.9**). The Loxahatchee River is also a state aquatic preserve. All waters within this planning unit are classified as Class III except for the C-18 Canal. The C-18 Canal is designated as a Class I water because it is connected to the West Palm Beach Water Catchment Area, to the immediate south, which is used for potable supply.

Attention is focused on ecological impacts within the river system related to reduced flows in the river and upriver advancement of the salinity wedge. The transition of the lower part of the Northwest Fork has resulted in cypress tree die-off and replacement by mangroves. Diversion of water to utilities for potable water supply and irrigation, hydrologic alterations by canals, the permanent opening of Jupiter Inlet, and saltwater intrusion due to ground water drawdown are considered to be the causes (SFWMD, July 2002).

Planning and Management Activities

The North Palm Beach Project Part 1 portion of CERP includes several components that will help aquatic and wetland resources in the Loxahatchee planning unit through water quality improvements, hydrologic reconnection, and restoring flows to the river system and estuary and/or restoring habitat.

The Pal-Mar and Corbett Hydropattern Restoration will provide hydrologic connections between the Corbett WMA and (1) the Moss Property, (2) the C-18 Canal, (3) the Indian Trail Improvement District, and (4) the L-8 Borrow Canal. The Hydropattern Restoration also includes water control structures, canal modifications, and the acquisition of 3,000 acres located between Pal-Mar and the J.W. Corbett WMA in northern Palm Beach County. This will help form an unbroken 126,000-acre greenbelt extending from the Dupuis Reserve near Lake Okeechobee across the J.W. Corbett WMA and south to Jonathan Dickinson State Park.

The C-51 and L-8 Reservoir project component of CERP includes a combination aboveground and in-ground reservoir that will provide a water supply for Palm Beach County and make water more available to the Loxahatchee River Basin. The project has a total storage capacity of 48,000 acre-feet located immediately west of the L-8 Borrow Canal and north of the C-51 Canal in Palm Beach County. Water will be backpumped into the reservoir from the C-51 Canal and Southern L-8 Borrow Canal during

the wet season, or periods when excess water is available, and returned to the C-51 and Southern L-8 during dry periods.

The C-51 Backpumping and Treatment project component includes backpumping facilities and a 2,400 acre-feet stormwater treatment area. Excess C-51 Canal water will be backpumped through existing and proposed water control structures and canals to the stormwater treatment area, which will provide water quality treatment prior to discharge into the West Palm Beach Water Catchment Area, formerly part of and located immediately south of the Loxahatchee Basin.

The C-17 Backpumping and Treatment project component includes backpumping facilities and a 2,200 acre-feet stormwater treatment area. Excess C-17 Canal water will be pumped through existing and proposed water control structures and canals to the stormwater treatment area that will provide water quality treatment prior to discharge into the West Palm Beach Water Catchment Area.

• Coastal Planning Unit

General Description

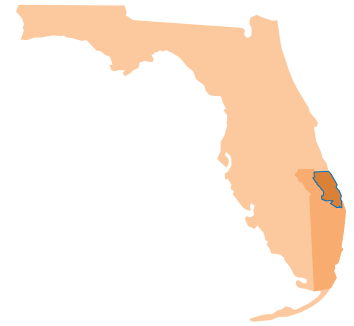
This planning unit includes estuarine and coastal waters of North Coastal, Mid Coastal, and South Coastal subbasins of the St. Lucie River Basin and the Coastal subbasin of the Loxahatchee River Basin. This comprises the most intensively developed portion of the two basins and also includes the southern IRL, Intracoastal Waterway, and the three inlets that connect the estuaries to the Atlantic Ocean (Fort Pierce Inlet, St. Lucie Inlet, and Jupiter Inlet). From north to south, this planning unit extends from the St. Lucie-Indian River county line to just below the Martin-Palm Beach county line. It includes the eastern parts of Fort Pierce and Stuart, as well as the coastal communities of Port Salerno, Golden Gate, Ocean Breeze Park, North River Shores, Sewall's Point, Jensen Beach, Jupiter Island, Tequesta, and the northern part of Jupiter. **Figures 3.10 and 3.11** are composite maps of this planning unit that show potentially impaired waters and potential point sources of pollution in the northern and southern portions of the planning unit.

Water Quality Summary

Table 3.12 is a summary of water quality assessment status for all the waterbody segments in this planning unit. These include the IRL, the main body of the SLE, plus estuarine waters of the Martin County coastline. Also included in the planning unit are waterbody segments associated with the nearshore coastal areas along the eastern margin of this basin group.

Eight of the waterbody segments in the planning unit represent estuarine waters of the southern IRL or segments of the SLE. The remaining 22 segments include nearshore coastal waters that extend along the Atlantic coastline.

The evaluation of estuarine waters includes waterbody segments within or discharging directly to the IRL. These include the North Coastal segment north of Ft. Pierce (3190), the discharge of Moore's Creek into the IRL at Ft. Pierce (3166), and the IRL from Ft. Pierce southward to the



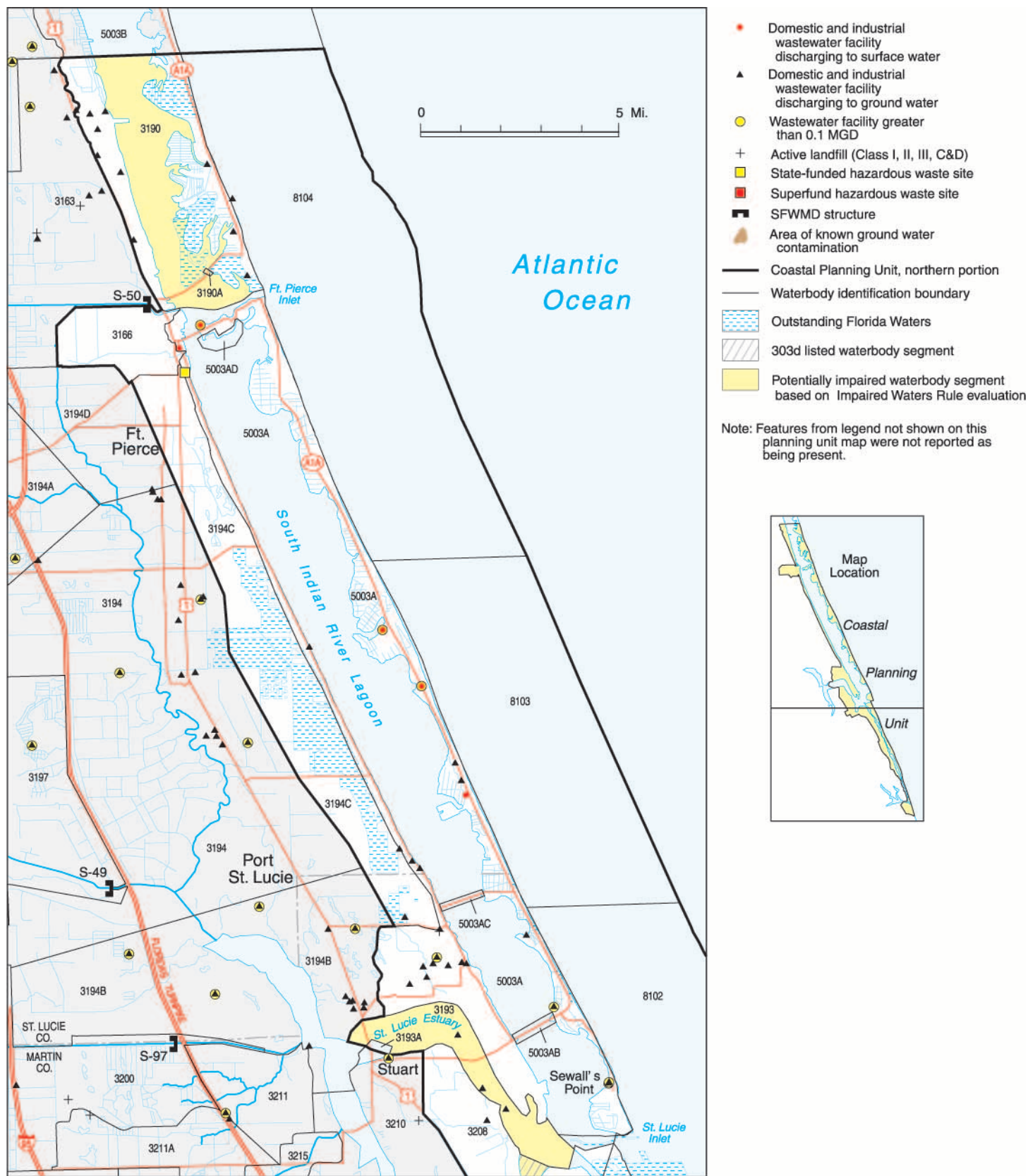


Figure 3.10: Composite Map of the Coastal Planning Unit, Northern Portion

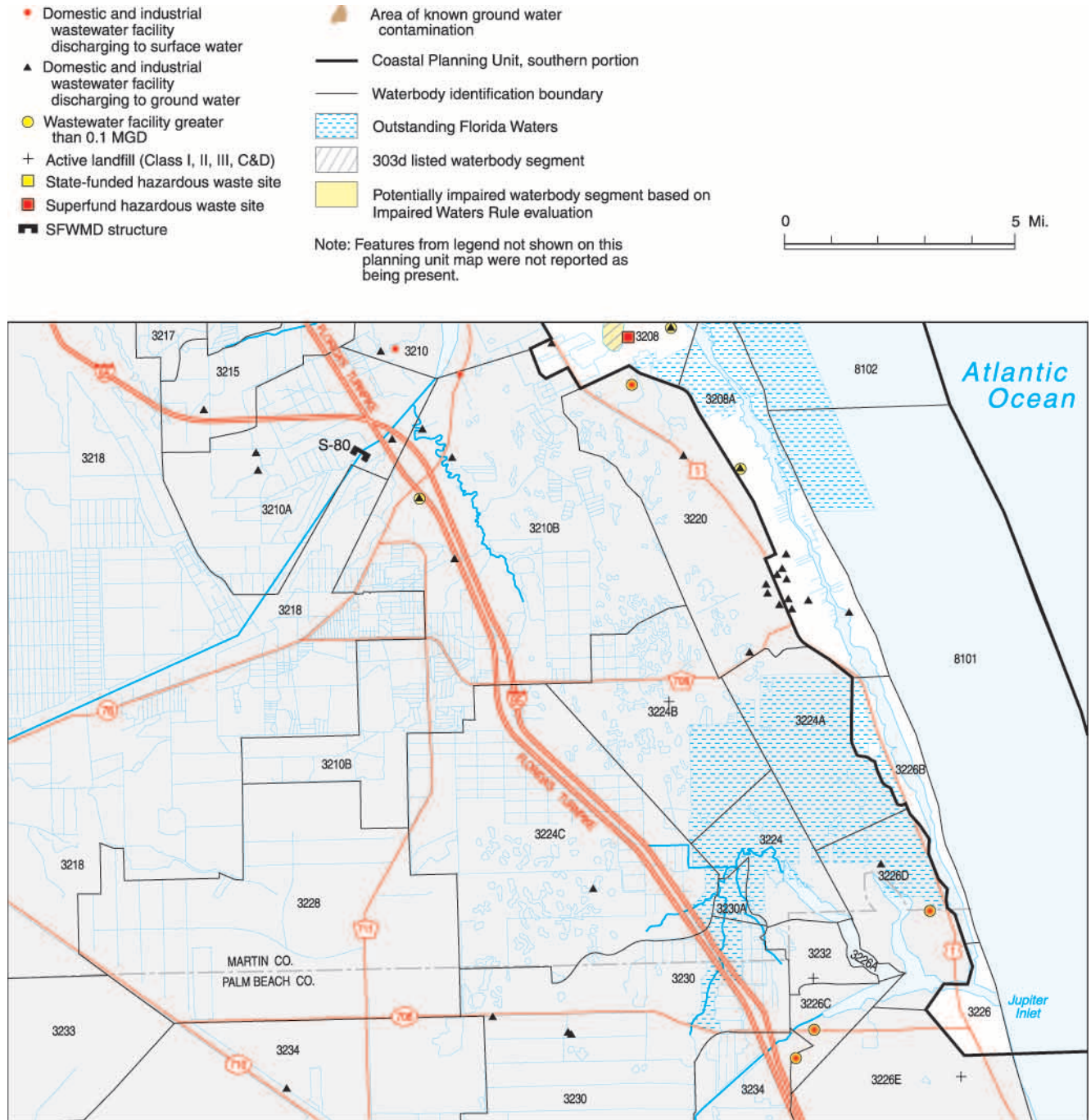


Figure 3.11: Composite Map of the Coastal Planning Unit, Southern Portion

Table 3.12: Integrated Water Quality Assessment Summary for the Coastal Planning Unit

WBID	Waterbody Segment	Waterbody Type ¹	Class ²	1998 303(d) List Parameters of Concern	Data Evaluation per 2001 Impaired Surface Waters Rule Criteria		
					Parameters Potentially Impaired ³	Parameters Not Impaired	Integrated Assessment Category of WBID
3166	Moore Creek	Estuary	3M	N/A	N/A	Chlorophyll <i>a</i> , Turbidity	2 Meets Some Uses
3190	North Coastal	Estuary	3M	N/A	Chlorophyll <i>a</i>	DO, Fecal Coliform, Turbidity	3d Verified List
3193	St. Lucie River	Estuary	3M	N/A	Chlorophyll <i>a</i>	DO, Turbidity	3d Verified List
3208	Manatee Pocket	Estuary	3M	Nutrients, DO	Chlorophyll <i>a</i>	DO, Turbidity	3d Verified List
3208A	Martin Co. ICWW	Estuary	3M	N/A	N/A	Chlorophyll <i>a</i> , DO, Turbidity	2 Meets Some Uses
3226	Jupiter Inlet	Estuary	3M	N/A	N/A	Chlorophyll <i>a</i> , DO, Fecal Coliform, Total Coliform, Turbidity	2 Meets Some Uses
3226B	Martin Co. ICWW	Estuary	3M	N/A	N/A	Chlorophyll <i>a</i> , DO, Fecal Coliform, Turbidity	2 Meets Some Uses
5003A	South Indian River	Estuary	2	N/A	N/A	Chlorophyll <i>a</i> , DO, Turbidity	2 Meets Some Uses
8101	Coastal Ocean 1	Coastal	3M	N/A	N/A	DO, Turbidity	2 Meets Some Uses
8104	Coastal Ocean 4	Coastal	3M	N/A	N/A	DO	2 Meets Some Uses
3190A	Little Jim Bridge	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
3193A	Roosevelt Bridge	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
5003AB	Stuart Causeway	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
5003AC	Jensen Beach Causeway	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
5003AD	South Causeway at Boat Ramp	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8101A	Jupiter Beach Park	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8101B	DuBois Park	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8101D	Hobe Sound Public Beach	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8101E	Hobe Sound Wildlife Refuge	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8102A	Bathtub Public Beach	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8102B	Stuart Public Beach	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8103A	Jensen Public Beach	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8103B	Waveland Public Beach	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data

Table 3.12 (continued)

WBID	Waterbody Segment	Waterbody Type ¹	Class ²	1998 303(d) List Parameters of Concern	Data Evaluation per 2001 Impaired Surface Waters Rule Criteria		Integrated Assessment Category of WBID
					Parameters Potentially Impaired ³	Parameters Not Impaired	
8104A	Surfside Park	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8104B	Jetty Park Beach	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8104C	Inlet State Park at River	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8104D	Inlet State Park at Ocean	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data
8104E	Pepper Park	Coastal	3M	N/A	N/A	N/A	3b Not Enough Data

Notes:

¹The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.

²The state's surface water classifications are as follows:

Class I: Potable water supplies

Class II: Shellfish propagation or harvesting

Class III: Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife

Class IV: Agricultural water supplies

Class V: Navigation, utility, and industrial use (there are no state waters currently in this class)

³Parameters in **bold** meet Verified List screening criteria

F = Fresh water

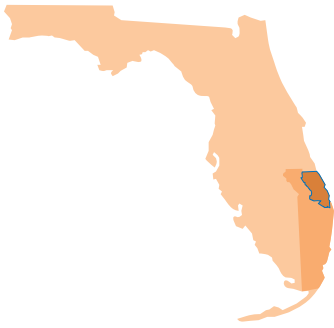
M = Marine

N/A = Not applicable, no parameters listed.

St. Lucie Inlet (5003A). Of these, the northernmost segment (3190) was identified as potentially impaired for nutrients (chlorophyll *a*) by the IWR evaluation (exceeding the Verified List screening criteria). The other two were found to meet some designated uses for certain parameters. However, historic data for Moore's Creek (3166) indicate that a potential water quality problem with respect to bacteria may exist.

Two estuarine segments further south, the main body of the SLE (St. Lucie River, 3193) and Manatee Pocket (3208) are both identified by the IWR evaluation as potentially impaired for nutrients (chlorophyll levels exceeding Verified List screening criteria). Manatee Pocket is also on the 1998 303(d) list for nutrients and DO, and based on data not available for the preliminary assessment may also be impaired for copper. The remaining estuarine segments (to the south) represent the Martin County Intracoastal Waterway (3208A and 3226B) and Jupiter Inlet (3226) were found by the IWR evaluation to meet some designated uses for certain parameters.

Generally, the coastal waterbody segments had insufficient data to be evaluated. However, two of these, one in south Martin County (8101) and one in northern St. Lucie County (8104), were found to meet designated uses for certain parameters.



Permitted Discharges and Land Uses

Point Sources. There are 50 permitted wastewater treatment facilities in this planning unit. Of these, 7 are permitted for surface water discharge. The Florida Power and Light St. Lucie Nuclear Power Plant is permitted to discharge a design capacity of 771.6 mgd of cooling water to the Atlantic Ocean. Fort Pierce Utilities Wastewater Treatment Plant is the largest domestic wastewater facility (9 mgd design capacity) and operates a deep injection well for its wastewater disposal. The St. Lucie County Utilities Hutchinson Island Wastewater Treatment Facility (1.6 mgd) operates a reuse system and also discharges into the Atlantic Ocean. Department records showed only 1 permitted landfill, the town of Ocean Breeze Landfill, which is now closed. In this planning unit, there are two state/federal hazardous waste sites: the Qual Krom Plating site in Fort Pierce that is in the state cleanup program and the Solitron Microwave NPL site in Port Salerno. This planning unit includes 11 dry cleaning facilities in the DSCP and more than 200 reported releases from petroleum storage facilities. There are no delineated areas. **Figures 3.10** and **3.11** show permitted wastewater treatment facilities, landfills, and hazardous waste sites in the Coastal planning unit.

Nonpoint Sources. More than 26 percent of this planning unit is in the urban/built-up land use category, most of which is in the medium density residential category. The Coastal planning unit includes the receiving waters for the major canals (C-25, C-24, C-23, C-44, and C-18) and rivers. The nutrient loads, sediments, and unregulated flows associated with the C&SF canals, plus smaller, more localized urban drainage canals, impact the coastal waterbodies.

Ecological Summary

Within this planning unit are most of the waters that have been designated for protection within the two basins. OFWs are shown in **Figures 3.10** and **3.11**. Aquatic preserves located in this planning unit include the IRL from Vero Beach to Ft. Pierce, Jensen Beach to Jupiter Inlet, and a portion of the Loxahatchee Aquatic Preserve. Waters within Avalon State Recreational Area, the Ft. Pierce Inlet State Recreational Area, the St. Lucie Inlet State Park, and Jonathan Dickinson State Park are all designated OFWs. Within the St. Lucie and Loxahatchee Basins, the IRL from the St. Lucie county line to Jupiter Inlet, including the SLE, is designated as a SWIM Plan restoration water. Most of these waters are designated as Class III waters, although in some areas where shellfishing is still viable, waters are classified as Class II. Class II waters are shown in **Figure 2.2**.

The most well-known ecological impacts have been observed in the SLE, including algal blooms, fish kills, lesions on fish, depletion of seagrasses, oyster beds, and other estuarine habitat due to turbid and/or oligohaline conditions, and smothering of benthic habitats by flocculent ooze. These impacts are related to excessive nutrient and pesticide loadings, unregulated releases of fresh water, eroded sediments being transported from agricultural and urban areas, and septic tank seepage from nearby urban areas.

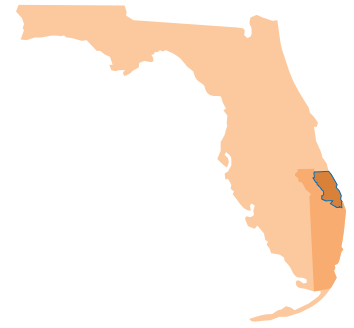
Discharges from C&SF canals and urban stormwater threaten estuarine habitat and create imbalances to varying degrees in many areas. Similar impacts are a concern in the IRL, where the C-25 Canal discharges directly to the IRL at Ft. Pierce.

Planning and Management Activities

As discussed previously, the major components within the Feasibility Study that are designed to ultimately improve water quality in the southern IRL and regulate delivery of fresh water to the IRL and SLE will occur at points along the course of the major C&SF canals and tributaries. The project includes storage, treatment, and redirection of water within the contributing watershed and reconnection of natural wetland areas that will absorb, detain, and treat waters that would otherwise be flushed into the estuary. However, the plan also includes restoration measures within the SLE itself. It includes removal of flocculent sediment from several areas where thick accumulations cover the estuary bottom. It also includes creation of artificial habitat for reestablishment of oyster beds in the estuary.

Several St. Lucie River Issues Team projects for treatment of urban stormwater have been approved and initiated. The Airport Ditch, Salerno Creek, Willoughby Creek, Golden Gate subdivision, and Poinciana Gardens subdivision projects were designed to provide treatment of stormwater from urban/residential areas that discharges to the SLE in the Manatee Pocket area. The Krueger Creek project, also under the Issues Team, includes dredging and removal of flocculent sediment from the bottom of Krueger Creek, a tributary to the SLE.

The Loxahatchee River District is the lead agency in a program to provide sewer service to urban areas in the southern part of the Coastal planning unit that are still being served by septic tanks. Within this same area, the town of Jupiter is in the planning phase of the Jones Creek Restoration and Stormwater Upgrade project.

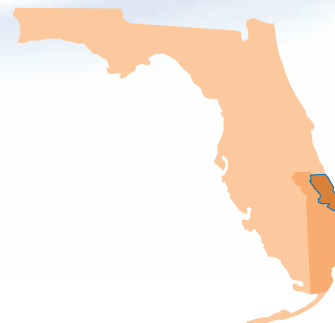


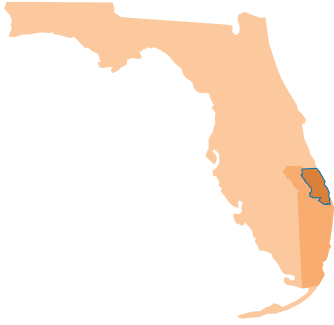


Chapter 4: Planning List of Potentially Impaired Waters

Chapter Summary

This chapter provides the Department's "Planning List" of potentially impaired surface waters in the St. Lucie and Loxahatchee Basins, describes the relationship between the Planning List and subsequent verified and 303(d) lists, and provides a list of waters that the Department intends to propose for delisting from the 1998 303(d) list. It also identifies waters that are not impaired and waters without enough data to determine potential impairment.





The Planning List

Under the Florida Watershed Restoration Act, the Planning List will be submitted to EPA for informational purposes only, and will not be used in the administration or implementation of any regulatory program. However, the Planning List is important, as it is used to guide monitoring in the basin and is the precursor to the Verified List of impaired waterbodies. As such, stakeholders are encouraged to review the Planning List carefully, including the data used by the Department to produce the list. If reviewers identify and have access to pertinent data that were not used, they should enter the data into STORET or submit the data to the Department so that it can be used in the evaluation of waterbodies to be included on the Verified List.

The Planning List

The Planning List (**Table 4.1**) includes all waterbody segments within the St. Lucie and Loxahatchee Basin Group that have been identified as potentially impaired. It includes potentially impaired waterbody segments identified in the Impaired Surface Waters Rule evaluation as well as those that had previously been included on the 1998 303(d) list. The methodology used to develop the Planning List follows the tenet of “independent applicability,” which means that a waterbody will be listed if any of its designated uses are potentially impaired. The Planning List table lists each waterbody segment, why it was listed as potentially impaired, and the parameters of concern. The table also differentiates between potential impairments identified by the IWR assessment and those related to the 1998 303(d) list. Waterbody segments on the Planning List are shown in **Figure 4.1**. In this figure, the entire watersheds for listed waterbody segments are highlighted. However, in most cases only the main waterbody in the assessment unit has been assessed, and other waters in the watershed may not be impaired.

Waterbody segments on the Planning List must meet specific thresholds and data sufficiency and data quality requirements in Section 62-303, Florida Administrative Code. A description of the legislative and regulatory background for the development of the planning and Verified Lists can be found in **Appendix A**. The methodology that describes the criteria and thresholds that are required for both lists under the IWR is available in **Appendix C**.

Relationship between the Planning List and the 303(d) List

The Planning List represents the first level of a two-stage process used to update the state’s Section 303(d) list of impaired waters for this basin group. These potentially impaired waters are further assessed during Phase 2 of the watershed management cycle to verify whether they are impaired. In addition to more thoroughly evaluating the data used to place these waters on the Planning List (including the verifying quality assurance and data sufficiency), the Department, working with local stakeholders, will identify other existing data and collect additional data as needed to complete the assessment. Once the additional monitoring is completed, the data will be assessed and the Department will develop a Verified List of impaired waters for which the Department will develop TMDLs. The criteria for data evaluation used to verify impaired waterbodies and produce the Verified List are described in **Appendix B**. The Verified List will be adopted by Secretarial Order and then submitted to the Environmental Protection Agency (EPA) as an update to Florida’s 303(d) list that will reflect the results of the IWR evaluation.

Table 4.1: Potentially Impaired Waters in the St. Lucie and Loxahatchee Basin Group

WBID	Waterbody Segment	Waterbody Type ¹	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired under the 2001 Impaired Surface Waters Rule Criteria
C-25/Basin 1 Planning Unit				
3160	C-25 Canal West (St. Johns Marsh)	Stream	N/A	DO
3163	C-25 East/Ft. Pierce Farms (Belcher Canal/Taylor Creek)	Stream	Nutrients, DO	DO
3189	Cowbone Creek (C-25)	Stream	Coliform, Nutrients, DO	DO, Fecal Coliform
North St. Lucie Planning Unit				
3194	North St. Lucie	Estuary	Coliform, Nutrients, Fish, DO	Copper, DO
3194A	Tenmile Creek	Stream	Coliform, Nutrients, BOD, DO	DO
3194B	St. Lucie	Estuary	Nutrients	Chlorophyll <i>a</i>
3194C	Savannas	Lake	N/A	Biology, DO
3194D	Fivemile Creek	Stream	N/A	DO
C-24 Planning Unit				
3197	C-24	Stream	Nutrients, DO	DO
C-23 Planning Unit				
3200	C-23	Stream	N/A	DO, Mercury
South St. Lucie Planning Unit				
3210	Tidal St. Lucie	Estuary	N/A	Imbalance of Flora and Fauna
3210A	St. Lucie Canal	Estuary	Nutrients, DO	DO
3210B	South Fork St. Lucie	Stream	Coliforms, Nutrients, BOD, TSS, DO	Biology, DO
3211	Bessey Creek	Estuary	Coliform, Nutrients, BOD, DO	DO
C-44 Planning Unit				
3218	C-44	Stream	N/A	DO, Mercury, Turbidity
Loxahatchee Planning Unit				
3224	Jonathan Dickinson	Estuary	N/A	DO
3224A	North Fork Loxahatchee	Stream	N/A	DO
3224B	Kitching Creek	Stream	Coliform, Nutrients, BOD, DO	Biology, DO
3224C	Cypress Creek	Stream	N/A	DO
3226A	NW Fork Loxahatchee	Estuary	Nutrients, DO	N/A
3226C	SW Fork Loxahatchee	Estuary	Coliform, Nutrients, DO	N/A
3230	Floodplain/Jupiter Farms	Stream	N/A	Biology, DO
3230A	NW Fork Loxahatchee	Stream	N/A	DO
3232	Loxahatchee River	Stream	Nonpoint Sources (narrative)	N/A
3234	C-18	Stream	Coliform, Fish, DO	Biology, DO, Fish, Mercury, Total Coliform
Coastal Planning Unit				
3190	North Coastal	Estuary	N/A	Chlorophyll <i>a</i>
3193	St. Lucie River	Estuary	N/A	Chlorophyll <i>a</i>
3208	Manatee Pocket	Estuary	Nutrients, DO	Chlorophyll <i>a</i>

Notes:

¹The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.

N/A = Not applicable, no parameters listed. Fish = Fish consumption advisory issued by FDOH based on mercury.

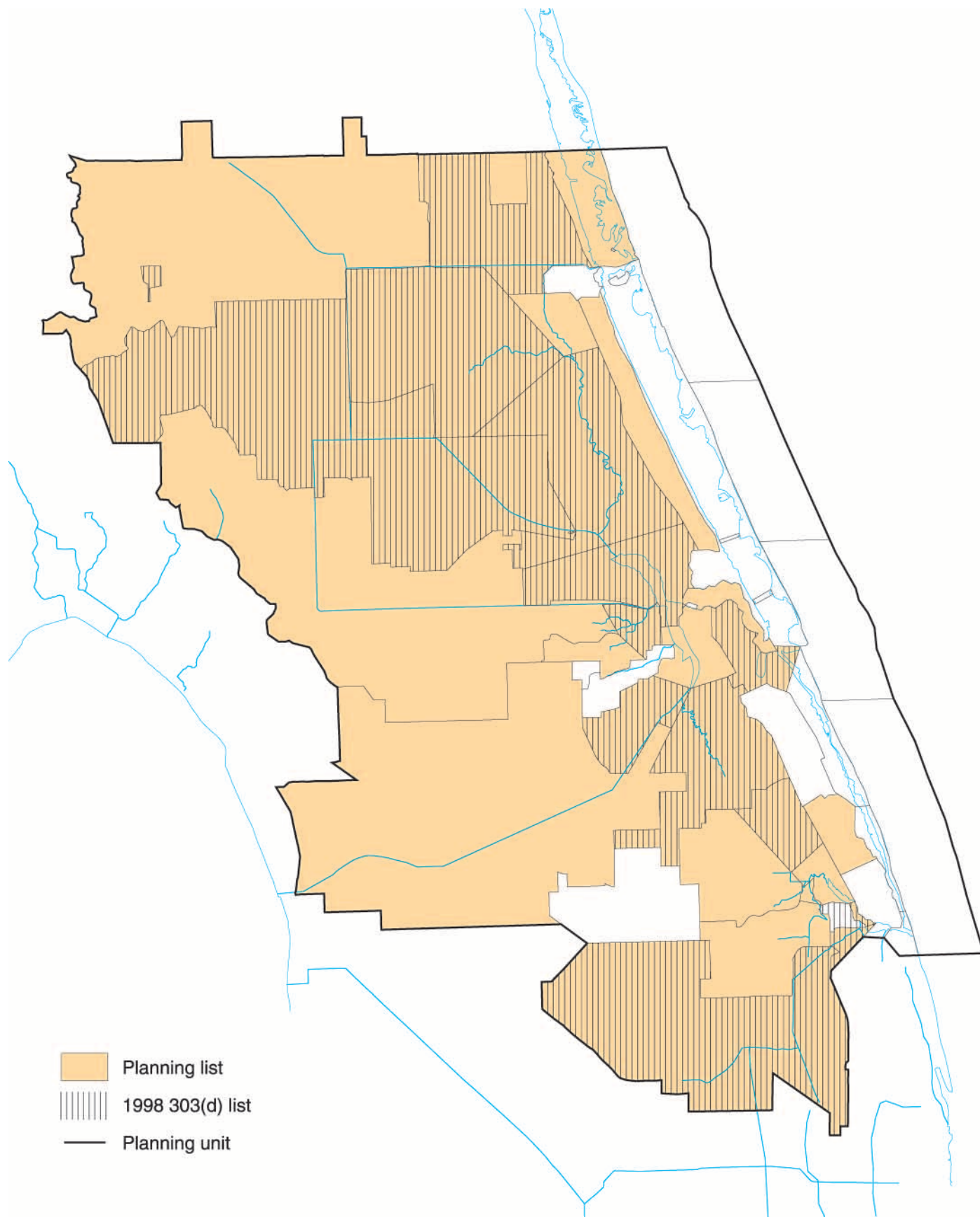


Figure 4.1: St. Lucie and Loxahatchee Basin Planning List for All Causes of Potential Impairment, with Overlay of 1998 303(d) List

Summary of Impairments

Within this basin group, there are a total of 59 waterbody segments. Of these, 30 are included on the Planning List as potentially impaired based on the IWR evaluation and/or the 1998 303(d) list criteria.

Table 4.2 provides a summary of the major parameters for which potential impairments were identified based on the 1998 303(d) list and by using the IWR evaluation criteria.

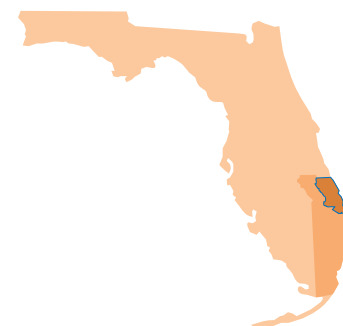


Table 4.2: Parameters Causing Potential Impairments in the St. Lucie and Loxahatchee Basin Group

	Potential Waterbody Segment Impairments						Total Potential Impairments
	1998 303(d) List		2001 Impaired Surface Waters Rule		Identified on Both Lists		
	SL	LOX	SL	LOX	SL	LOX	
Dissolved Oxygen	1	2	6	5	9	2	25
Nutrients (General, Chlorophyll <i>a</i> , Other Data)	11	2	3	—	2	—	18
Coliform (general, total, fecal)	5	2	—	—	1	1	9
Biology	—	—	3	3	—	—	6
Metals (Mercury)	—	—	2	1	—	—	3
Metals (Copper)	—	—	1	—	—	—	3
Suspended Solids (Turbidity)	2	—	1	—	—	—	3
Fish Advisory	1	—	—	—	—	1	2

Notes:

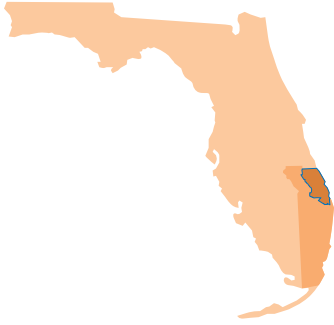
SL-St. Lucie Basin

LOX- Loxahatchee River Basin

It can be seen in **Table 4.2** that dissolved oxygen (DO) levels that exceed criteria are the most prevalent potential cause of impaired waterbody segments in this basin group. As previously mentioned in this report, low DO levels are not always attributable to pollutants. For this reason, additional work will be conducted prior to development of the Verified List for this basin group to differentiate between pollutant-related and other causes of low DO.

Nutrients appear as the most prevalent potential cause of impairments on the 1998 303(d) list. However, based on the IWR evaluation criteria (chlorophyll-*a* concentrations in streams and estuaries, TSI in lakes, and other data that indicate imbalance of flora and fauna), only five waterbody segments were identified as potentially impaired by nutrients. Additional monitoring work to collect more chlorophyll data is being completed in all of the waterbody segments and will be evaluated to verify the status of waterbodies potentially impaired by nutrients.

Other notable parameters indicating potentially impaired waterbody segments in this basin group include coliform bacteria, biology (for fresh-water segments), metals (notably mercury and copper), suspended solids



(turbidity), and fish consumption advisories (based on mercury). At the completion of Phase 2, the data for these parameters will be reevaluated to verify the condition of the waterbody segments being monitored. More information about the Phase 2 monitoring activities is provided in Chapter 5.

Waters with Insufficient Data to Determine Impairment

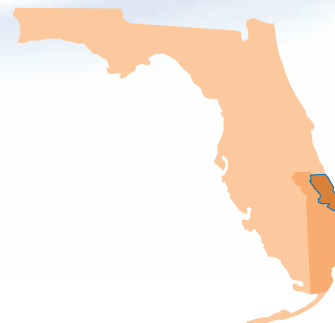
Any waters that do not have sufficient data to be analyzed in accordance with the requirements of the IWR but that were included on the 1998 303(d) list will remain on the 303(d) list maintained by EPA. They will also be on the Planning List until they have sufficient data for their condition to be evaluated and verified. The Department's goal is to collect sufficient data for these waterbodies on the Planning List within Phase 2 of the watershed cycle in order to verify their condition.

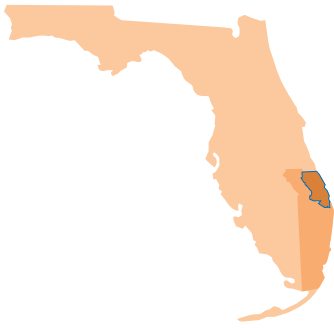
For many waterbodies in the St. Lucie and Loxahatchee Basin Group, the available water quality data are not sufficient to make an assessment and they are not on the 1998 303(d) list. Because of resource limitations, it will not be possible for the Department to monitor all of these waterbodies during the first watershed management cycle. The priority during Phase 2 of the cycle is to conduct monitoring and data gathering to address potentially impaired waters identified on the Planning List. While the Department plans to monitor waters without enough data to determine potential impairment during subsequent watershed cycles, available data gathered by others will be used for this purpose. It is important that the Department and stakeholders in the area coordinate their monitoring efforts to most efficiently collect data for these waterbodies. Monitoring and the evaluation of data are discussed in Chapter 5.

Chapter 5: Strategic Monitoring and Data Evaluation

Chapter Summary

To verify the impairment of waterbody segments currently on the Planning List, to collect data for total maximum daily load (TMDL) development, and to assess segments of the basin with insufficient or no data, the Department will need to work with local entities to collect additional information through strategic monitoring. This chapter discusses potential existing sources of data and summarizes strategic monitoring priorities, needs, and requirements. It also describes the steps needed to develop a strategic monitoring plan.





Strategic Monitoring and Data Acquisition Priorities

As previously noted, the Planning List provided in Chapter 4 (**Table 4.1**) differentiates between potential impairments identified in the impaired waters assessment and those identified in the 1998 303(d) list. Waters on the Planning List must meet specific thresholds and data sufficiency and data quality requirements in the Impaired Surface Waters Rule (IWR) (Section 62-303, Florida Administrative Code). However, waters that were previously on the 1998 303(d) list, but for which there were insufficient data for an assessment, are also included on the Planning List. Additional data that are collected will be used to verify the status of waters listed as potentially impaired, to assess waters with insufficient data, and to support modeling efforts for impaired waters that will require TMDLs.

Due to resource limitations, the Department alone is not capable of addressing all of the strategic monitoring objectives within this 5-year basin rotation cycle for the St. Lucie and Loxahatchee Basin Group. The Department's focus for the months prior to the submittal of the Verified List of impaired waters for this basin group (in 2003) is to obtain the data necessary to verify the status of potentially impaired waters. Priority in doing so has been given to collecting data on the Planning List waterbody segments that are also on the 1998 303(d) list and the potentially impaired receiving waterbodies that did not have sufficient data to verify their condition at the time the Planning List was generated. Data from other monitoring organizations will be included in the evaluation and will provide support in verifying the condition of potentially impaired waterbodies and in providing more data by which other waterbodies can be evaluated.

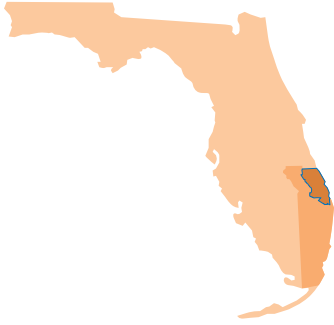
Data Acquisition Objectives

All waterbody segments on the Planning List in this basin group have been targeted for additional monitoring and data acquisition. As discussed previously, the Department's focus prior to producing the Verified List is to collect and assemble sufficient data to evaluate waterbodies that are potentially impaired for parameters that do not have sufficient data to meet the Verified List screening criteria. Particular emphasis is on those waterbodies that are on the 1998 303(d) list. An additional monitoring priority is to develop data that may be necessary for identifying pollutants causing DO exceedances or biological impairments. As mentioned in Chapter 3, these conditions are at times not attributable to pollutants.

The objectives of the water quality data gathering and evaluation of data to verify the condition the waterbody segments on the Planning List are summarized in **Table 5.1**.

Table 5.1: Strategic Monitoring and Data Evaluation Objectives for Planning List Waters in the St. Lucie and Loxahatchee Basin Group

Monitoring and Data Evaluation Objectives to Address Planning List Waterbody Segments				
WBID	Waterbody Segment	Verify Potential Impairment (Parameters Exceeding Planning List Screening Criteria and/or Included on 1998 303(d) list)	Confirm Impairment (Param- eters Exceeding Verified List Screening Criteria)	Identify/Verify Causative Pollutant(s)
C-25/Basin 1 Planning Unit				
3160	C-25 Canal West (St. Johns Marsh)		DO	DO
3163	C-25 East/Ft. Pierce Farms (Belcher Canal/ Taylor Creek)	Nutrients	DO	DO
3189	Cowbone Creek (C-25)	Fecal Coliform, Nutrients, DO		DO (if verified)
North St. Lucie Planning Unit				
3194	North St. Lucie	Coliform, Nutrients, Copper	DO	DO
3194A	Tenmile Creek	Coliform, Nutrients	DO	DO
3194B	St. Lucie		Chlorophyll <i>a</i>	
3194C	Savannas		Biology, DO	Biology, DO
3194D	Fivemile Creek	DO		DO (if verified)
C-24 Planning Unit				
3197	C-24	Nutrients	DO	DO
C-23 Planning Unit				
3200	C-23	Mercury	DO	DO
South St. Lucie Planning Unit				
3210	Tidal St. Lucie	Imbalance of Flora and Fauna		Imbalance of Flora and Fauna
3210A	St. Lucie Canal	Nutrients, DO		DO (if verified)
3210B	South Fork St. Lucie	Coliforms, Nutrients, TSS	Biology, DO	Biology, DO
3211	Bessey Creek	Coliform, Nutrients, DO		DO (if verified)
C-44 Planning Unit				
3218	C-44	DO, Mercury	Turbidity	DO (if verified)
Loxahatchee Planning Unit				
3224	Jonathan Dickinson	DO		DO (if verified)
3224A	North Fork Loxahatchee		DO	DO
3224B	Kitching Creek	Coliform, Nutrients, DO	Biology	Biology, DO (if verified)
3224C	Cypress Creek		DO	DO
3226A	NW Fork Loxahatchee	Nutrients, DO		DO (if verified)
3226C	SW Fork Loxahatchee	Coliform, Nutrients, DO		DO (if verified)
3230	Floodplain/Jupiter Farms		Biology, DO	Biology, DO
3230A	NW Fork Loxahatchee		DO	DO
3234	C-18	Mercury, Total Coliform	Biology, DO	Biology, DO
Coastal Planning Unit				
3190	North Coastal		Chlorophyll <i>a</i>	
3193	St. Lucie River		Chlorophyll <i>a</i>	
3208	Manatee Pocket	Nutrients, DO	Chlorophyll <i>a</i>	DO (if verified)



Phase 2 Assessment: Data Collection and Database Management

The Department has been working to update the database that will be used in the Phase 2 assessment; we are collecting our own data as well as working with the other key data providers to provide the most current and comprehensive water quality dataset. The data to be used in determining waterbodies to be included on the Verified List include

- existing data within the database that were not collected during the Planning List period of record,
- existing data that had not been imported into the IWR database at the time of the Planning List evaluation, and
- monitoring data that had not been collected or reported.

The database currently includes data before and after the Planning List period of record that were not evaluated as part of the Planning List screening process. The 10-year period of record for the data used to produce the Planning List for the St. Lucie and Loxahatchee Basin Group extends from the beginning of 1991 to the end of 2000. The period of record for the Verified List evaluation will be from the beginning of 1996 to the end of 2002. The waterbody assessment described in Chapter 3 includes a preliminary evaluation and discussion on waterbody segments exceeding Verified List screening criteria (Category 3d in the integrated assessment format). The additional 2 years of data that already exist in the database (2000 through 2002) will be used in the Verified List evaluation as well as new data not yet evaluated.

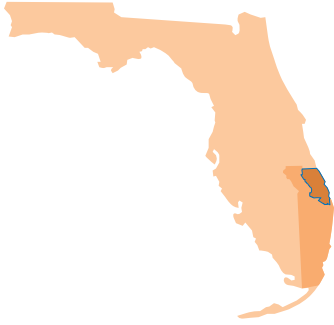
There are data in the IWR database that were uploaded since the Planning List evaluation was conducted. Over the past year, the Department has provided support to organizations that are interested in uploading their water quality to the national STORET database. Data uploaded since the Planning List evaluation will be included in the database. A significant number of data records produced by SFWMD and the Loxahatchee River District that were not available for the Planning List evaluation are anticipated to be available via STORET and will be included in the Verified List evaluation. Additional data from other providers may also be included in the next download from STORET.

Based on the preliminary data being reviewed earlier in 2002, a plan was developed by the Department to address potential data gaps. Beginning in early 2002, a strategic monitoring program has been carried out by the Water Quality Section of the Department's Southeast District. The focus of this program has been to collect the additional data necessary to verify conditions in many of the potentially impaired waterbody segments. A minimum of 10 samples was collected from each of the potentially impaired waterbody segments. A particular emphasis of this program was to collect chlorophyll data in accordance with the IWR rule criteria to properly evaluate nutrient-related impairments within segments of the St. Lucie Estuary, Indian River Lagoon, and major canals.

Verified List Development and Public Comment

The Verified List of impaired waters for this basin group will be produced by the Department in the early summer of 2003 and will be adopted by the Secretary of the Department and submitted to EPA later in the year. The tentative submittal date for the proposed Verified List for the St. Lucie and Loxahatchee Basin Group is October 1, 2003. Prior to the Secretary's action, the Department will distribute a draft Verified List to the public for review and comment and hold public workshops to solicit comments. As part of the review process, public workshops will be advertised and held in each basin to exchange information and solicit public involvement. If additional information or data are provided during the public comment period or before, it will be considered by the Department prior to submittal of the proposed list to the Secretary and EPA.

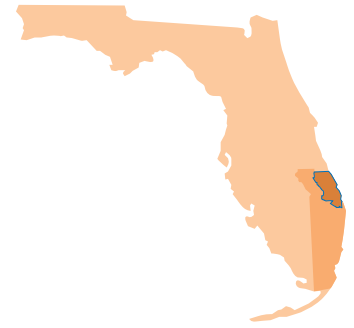




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St. Lucie and Loxahatchee Appendices

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Appendix A: Legislative and Regulatory Background on the Watershed Management Approach and TMDLs (included as an appendix in this report, pending the completion of a Web site)

Federal and State Legislation on Surface Water Quality and TMDLs

Clean Water Act

Congress enacted the Clean Water Act in 1972 with the goal of restoring and maintaining the “chemical, physical, and biological integrity of the nation’s waters” (33 U.S.C. § 1251[a]). The ultimate goal of the act is to eliminate the “discharge of [all] pollutants into navigable waters” (33 U.S.C. § 1251[a][1]).

Section 305(b) of the Clean Water Act requires states to report biennially to the U.S. Environmental Protection Agency (EPA) on their water quality. The 305(b) assessment report provides information on the physical, chemical, biological, and cultural features of each river basin in Florida. This initial assessment provides a common factual basis for identifying information sources and major issues, and for determining the future changes, strategies, and actions needed to preserve, protect, and/or restore water quality. Understanding the physical framework of each basin allows the development of a science-based methodology for assessing water quality and an accurate picture of the waters that are most impaired or vulnerable to contamination.

Section 303(d) of the Clean Water Act requires states to submit to the EPA lists of surface waters that do not meet applicable water quality standards and establish total maximum daily loads (TMDLs) for each of these waters on a prioritized schedule. A pollution limit is then allocated to each pollutant source in an individual river basin.

A TMDL represents the maximum amount of a given pollutant that a waterbody can assimilate and still meet all of its designated uses (see the sidebar on Florida’s surface water quality classifications for a listing of these classifications). A waterbody that does not meet its designated use is defined as *impaired*.

SIDEBAR: FLORIDA’S SURFACE WATER QUALITY CLASSIFICATIONS

Florida’s water quality standards program, the foundation of the state’s program of water quality management, designates the “present and future most beneficial uses” of the waters of the state (Section 403.061[10], Florida Statutes). Water quality criteria, expressed as numeric or narrative limits of pollutants, describe the water quality necessary to maintain these uses for surface water and ground water. Florida’s surface water is protected for five designated use classifications, as follows:

<i>Class I</i>	<i>Potable water supplies</i>
<i>Class II</i>	<i>Shellfish propagation or harvesting</i>
<i>Class III</i>	<i>Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife</i>
<i>Class IV</i>	<i>Agricultural water supplies</i>
<i>Class V</i>	<i>Navigation, utility, and industrial use (there are no state waters currently in this class)</i>

Florida Watershed Restoration Act

In 1998, the EPA settled a lawsuit with the environmental group Earthjustice over Florida's TMDL Program. The Consent Decree resulting from the lawsuit requires all TMDLs on the state's 1998 Section 303(d) list of impaired waters to be developed in thirteen years. If the state fails to develop the TMDLs, the EPA is required to do so.

In response to concerns about the TMDL lawsuit and in recognition of the important role that TMDLs play in restoring state waters, the 1999 Florida legislature enacted the Florida Watershed Restoration Act (Chapter 99-223, Laws of Florida). The act clarified the Department's statutory authority to establish TMDLs, required the Department to develop a methodology for identifying impaired waters, specified that the Department could develop TMDLs only for waters on a future state list of impaired waters developed using this new methodology, and directed the Department to establish an Allocation Technical Advisory Committee to address the allocation process for TMDLs. The act also declared Lake Okeechobee impaired and, as required under the TMDL Consent Decree, allowed the state to develop a TMDL for the lake (see the sidebar for a description of the legislation's major provisions).

SIDEBAR: THE FLORIDA WATERSHED RESTORATION ACT

The Florida Watershed Restoration Act contains the following major provisions:

- *Establishes that the 303(d) list submitted to the EPA in 1998 is for planning purposes only.*
- *Requires the Department to adopt 303(d) listing criteria (that is, the methodology used to define impaired waters) by rule.*
- *Requires the Department to verify impairment and then establish basin-specific Verified Lists. The Department must also evaluate whether proposed pollution control programs are sufficient to meet water quality standards, list the specific pollutant(s) and concentration(s) causing impairment, and adopt the basin-specific 303(d) list by Secretarial Order.*
- *Requires the Department's Secretary to adopt TMDL allocations by rule. The legislation requires the Department to establish "reasonable and equitable" allocations of TMDLs, but does not mandate how allocations will be made among individual sources.*
- *Requires that TMDL allocations consider existing treatment levels and management practices; the differing impacts that pollutant sources may have; the availability of treatment technologies, best management practices (BMPs), or other pollutant reduction measures; the feasibility, costs, and benefits of achieving the allocation; reasonable time frames for implementation; the potential applicability of moderating provisions; and the extent that nonattainment is caused by pollution from outside Florida, discharges that have ceased, or alteration to a waterbody.*
- *Required a report to the legislature by February 2001 addressing the allocation process.*

- *Authorizes the Department to develop basin plans to implement TMDLs, coordinating with the water management districts, the Florida Department of Agriculture and Consumer Services, the Soil and Water Conservation Districts, regulated parties, and environmental groups in assessing waterbodies for impairment, collecting data for TMDLs, developing TMDLs, and conducting at least one public meeting in the watershed. Implementation is voluntary if not covered by regulatory programs.*
- *Authorizes the Department and the Florida Department of Agriculture and Consumer Services to develop interim measures and BMPs to address nonpoint sources. While BMPs would be adopted by rule, they will be voluntary if not covered by regulatory programs. If they are adopted by rule and the Department verifies their effectiveness, then implementation will provide a presumption of compliance with water quality standards.*
- *Directs the Department to document the effectiveness of the combined regulatory/voluntary approach and report to the legislature by January 1, 2005. The report will include participation rates and recommendations for statutory changes.*

Determining Impairment Based on the State's Impaired Surface Waters Rule

Section 303(d) of the Clean Water Act and Chapter 403.067, Florida Statutes, describe impaired waters as those waterbodies or waterbody segments that do not meet applicable water quality standards. "Impairment" is a broad term that includes designated uses, water quality criteria, the Florida antidegradation policy, and moderating provisions (see the sidebar below for explanations of these terms).

The state's Identification of Impaired Surface Waters Rule (Section 62-303, Florida Administrative Code) was developed in cooperation with a Technical Advisory Committee and adopted by the Florida Environmental Regulatory Commission on April 26, 2001. It provides a science-based methodology for evaluating water quality data in order to identify impaired waters, and it establishes specific criteria for impairment based on chemical parameters, the interpretation of narrative nutrient criteria, biological impairment, fish consumption advisories, and ecological impairment. The rule is available at <http://www.dep.state.fl.us/water/tmdl/docs/AmendedIWR.pdf>.

The Impaired Surface Waters Rule also establishes thresholds for data sufficiency and data quality, including the minimum sample size required and the number of exceedances of the applicable water quality standard for a given sample size that identify a waterbody as impaired. The number of exceedances is based on a statistical approach designed to provide greater confidence that the outcome of the water quality assessment is correct. **Waters that are identified as impaired through the Impaired Surface Waters Rule are prioritized for TMDL development and implementation.**

SIDEBAR: EXPLANATION OF TERMS

- **Designated uses**, discussed in an earlier sidebar, comprise the five classifications applied to each of the state's surface waterbodies.
- **Water quality criteria** comprise numeric or narrative limits of pollutants.

- **The Florida Antidegradation Policy** (Rules 62-302.300 and 62-4.242, Florida Administrative Code) recognizes that pollution that causes or contributes to new violations of water quality standards or to the continuation of existing violations is harmful to the waters of the state. Under this policy, the permitting of new or previously unpermitted existing discharges is prohibited where the discharge is expected to reduce the quality of a receiving water below the **classification** established for it. Any lowering of water quality caused by a new or expanded discharge to surface waters must be in the public interest (that is, the benefits of the discharge to public health, safety, and welfare must outweigh any adverse impacts on fish and wildlife or recreation). Further, the permittee must demonstrate that other disposal alternatives (for example, reuse) or pollution prevention are not economically and technologically reasonable alternatives to the surface water discharge.
- **Moderating provisions** (provided in Rules 62-302.300[10], 62-4 and 62-6, Florida Administrative Code, and described in Rules 62-302.300, 62-4.244, 62-302.800, 62-4.243, Florida Administrative Code, and Chapters 403.201 and 373.414, Florida Statutes) include mixing zones, zones of discharge, site-specific alternative criteria, exemptions, and variances. These provisions are intended to moderate the **applicability** of water quality standards where it has been determined that, under certain special circumstances, the social, economic, and environmental costs of such **applicability** outweigh the benefits.

Determining impairment in individual waterbodies takes place in two phases. First, in each river basin the Department evaluates the existing water quality data, using the methodology prescribed in the Impaired Surface Waters Rule, to determine whether waters are potentially impaired. Waters found to be potentially impaired are included on a *Planning List* for further assessment under Chapters 403.067(2) and (3), Florida Statutes. As required by Subsection 403.067(2), Florida Statutes, the Planning List is not used to administer or implement any regulatory program. It is submitted to the EPA for informational purposes only.

The second step is to assess waters on the Planning List under Chapter 403.067(3), Florida Statutes, as part of the Department's watershed management approach (described in the following section). The Department carries out additional data gathering and strategic monitoring, focusing on these potentially impaired waters, and determines—using the methodology in Part III, Section 62-303.400, Florida Administrative Code—if a waterbody is, in fact, impaired and if the impairment is caused by pollutant discharges.

An Assessment Report is produced containing the results of this updated evaluation and a *Verified List* of impaired waters. The criteria for the Verified List are more stringent than those for the Planning List. The Department is required to develop TMDLs for waters on the Verified List under Subsection 403.067(4), Florida Statutes. A watershed management plan (called a Basin Management Action Plan) to reduce the amount of pollutants that cause impairments must also be produced and implemented.

The Verified List is adopted by Secretarial Order in accordance with the Florida Watershed Restoration Act. Once adopted, the list is submitted to the EPA for approval as the state's Section 303(d) list of impaired waters for the basin.

Implementing TMDLs

The Watershed Management Approach

The Department's statewide approach to water resource management, called the watershed management approach, is the framework for implementing TMDLs as required by the federal and state governments. The approach does not focus on individual sources of pollution. Instead, each basin is assessed as an entire functioning system, and aquatic resources are evaluated from a basinwide perspective that considers the cumulative effects of human activities. Water resources are managed on the basis of natural boundaries, such as river basins, rather than political or regulatory boundaries. Federal, state, regional, tribal, and local governments identify watersheds not meeting clean water or other natural resource goals and work cooperatively to focus resources and implement effective strategies to restore water quality. Extensive public participation in the decision-making process is crucial.

The watershed management approach is not new, nor does it compete with or replace existing programs. Rather than relying on single solutions to water resource issues, it is intended to improve the health of surface water and ground water resources by strengthening coordination among such activities as monitoring, stormwater management, wastewater treatment, wetland restoration, land acquisition, and public involvement.

By promoting the management of entire natural systems and addressing the cumulative effects of human activities on a watershed basis, this approach is intended to protect and enhance the ecological structure, function, and integrity of Florida's watersheds. It provides a framework for setting priorities and focusing the Department's resources on protecting and restoring water quality, and aims to increase cooperation among state, regional, local, and federal interests. By emphasizing public involvement, the approach encourages stewardship by all Floridians to preserve water resources for future generations.

The watershed approach is intended to speed up projects by focusing funding and other resources on priority water quality problems, strengthening public support, establishing agreements, and funding multiagency projects. It avoids duplication by building on existing assessments and restoration activities and promotes cooperative monitoring programs. It encourages accountability for achieving water quality improvements through improved monitoring and the establishment of TMDLs.

The Watershed Management Cycle

As part of the Department's watershed management approach, TMDLs will be developed, and the corresponding load reductions allocated, as part of a watershed management cycle, which rotates through the state's fifty-two river basins over a nine-year period. The cycle's five phases are as follows:

- **Phase 1: Preliminary Watershed Evaluation.** For each river basin, a **Basin Status Report** is developed, containing a Planning List of potentially impaired waters that may require the establishment of TMDLs. The report characterizes each basin's hydrologic, ecological, and socioeconomic setting as well as historical, current, and

proposed watershed management issues and activities. It also contains a preliminary evaluation of major water quality parameters, water quality issues by planning unit, an evaluation of ecological resources, and basinwide pollutant loading trends related to land uses. At the end of Phase 1, a **Strategic Monitoring Plan** is developed.

- **Phase 2: Strategic Monitoring and Assessment.** Additional data are collected through strategic monitoring and uploaded to STORET. The data are used to verify whether potentially impaired waters in each basin are impaired and to calibrate and verify models for TMDL development. At the end of Phase 2, an **Assessment Report** is produced for each basin that contains a Verified List of impaired waters. The report also provides an updated and more thorough evaluation of water quality, associated biological resources, and current management plans. The Department will adopt the **Verified List** by the Department through a Secretarial Order and submit it to the EPA as the state's Section 303(d) list of impaired waters.
- **Phase 3: Development and Adoption of TMDLs.** TMDLs for priority impaired waters in the basin will be developed and adopted by rule. Because TMDLs cannot be developed for all listed waters during a single watershed management cycle due to fiscal and technical limitations, waterbodies will be prioritized using the criteria in the Identification of Impaired Surface Waters Rule, Section 62-303, Florida Administrative Code.
- **Phase 4: Development of Basin Management Action Plan.** A **Basin Management Action Plan** will be developed for each basin that specifies how pollutant loadings from point and nonpoint sources of pollution will be allocated and reduced, in order to meet TMDL requirements. The plans will include regulatory and nonregulatory (i.e., voluntary), structural and nonstructural strategies, and existing management plans will be used where feasible. The involvement and support of affected stakeholders in this phase will be especially critical.
- **Phase 5: Implementation of Basin Management Action Plan.** Implementation of the activities specified in the **Basin Management Action Plan** will begin. This includes carrying out rule development as needed, securing funding, informing stakeholders and the public, and monitoring and evaluating the implementation of the plan.

To implement the watershed cycle, the state's river basins have been divided into five groups within each of the Department's six districts statewide, and each district will assess one basin group each year. **Table A-1** shows the basin groups for implementing the cycle in the Department's districts, and **Figure A-1** shows these groups and the rotating cycle in the districts. **Table A-2**, which lists the basin rotation schedule for TMDL development and implementation, shows that it will take nine years to complete one full cycle of the state.

The watershed management cycle is an iterative, or repeated, process. One of its key components is that the effectiveness of management activities (TMDL implementation)

will be monitored in successive cycles. Monitoring conducted in Phase 2 of subsequent cycles will be targeted at evaluating whether water quality objectives are being met and whether individual waters are no longer impaired. The Department also will track the implementation of scheduled restoration activities, whether required or voluntary, to ensure continued progress towards meeting the TMDLs.

Table A-1: Basin Groups for Implementing the Watershed Management Cycle, by Department District Office

District	Group 1 Basins	Group 2 Basins	Group 3 Basins	Group 4 Basins	Group 5 Basins
Northwest	Ochlockonee-St. Marks Rivers	Apalachicola-Chipola Rivers	Choctawhatchee River and Bay and St. Andrews Bay	Pensacola Bay	Perdido River and Bay
Northeast	Suwannee River	Lower St. Johns River	Upper St. Johns River	St. Marys-Nassau Rivers	Northeast Coast Lagoons
Central	Ocklawaha River	Middle St. Johns River		Kissimmee River	Indian River Lagoon
Southwest	Tampa Bay	Tampa Bay Tributaries	Sarasota Bay and Peace-Myakka Rivers	Withlacoochee River	Springs Coast
South	Everglades West Coast	Charlotte Harbor	Caloosahatchee River	Fisheating Creek	Florida Keys
Southeast	Lake Okeechobee	St. Lucie and Loxahatchee Rivers	Lake Worth Lagoon/Palm Beach Coast	Southeast Urban Coast	Everglades

Table A-2: Basin Rotation Schedule for TMDL Development and Implementation

Phased Approach: *9 years to complete one full cycle of state*

Year/ Group	2000	2001	2002	2003	2004	2005	2006	2007	2008
Group 1	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 1	Phase 2	Phase 3	Phase 4
Group 2		Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 1	Phase 2	Phase 3
Group 3			Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 1	Phase 2
Group 4				Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 1
Group 5					Phase 1	Phase 2	Phase 3	Phase 4	Phase 5

1 2 3 4 5 6 7 8 9

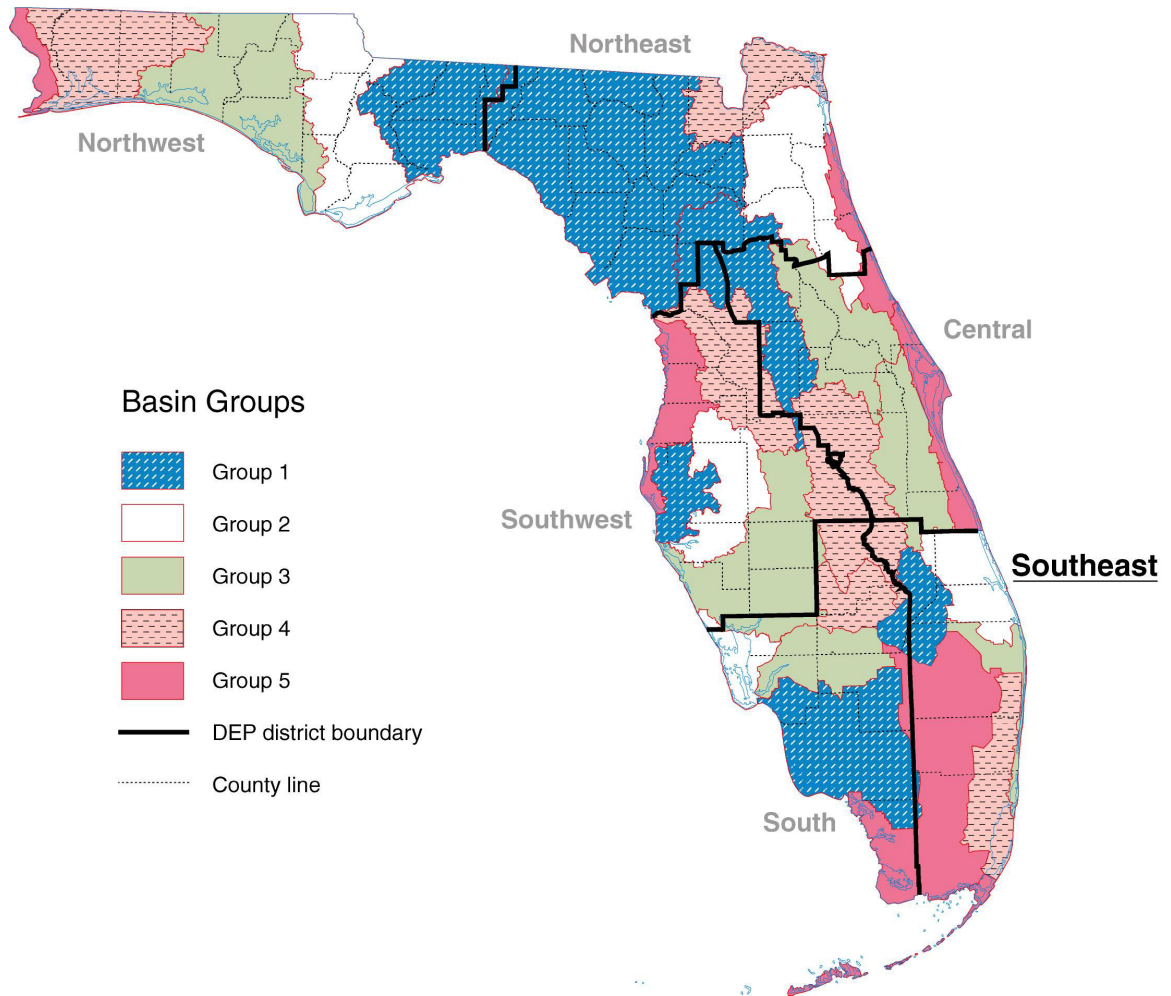


Figure A-1: Five-Year Rotating Basin Cycle in the Department's Six Districts

Pollutants can enter a waterbody through point source discharges (generally from a specific facility) or nonpoint discharges (e.g., stormwater runoff, septic tanks). Government agencies, businesses, organizations, and individuals who contribute to these discharges will be asked to share the responsibility of attaining TMDLs through load allocations (the amount of a specified pollutant allotted for discharge) that are based on an established TMDL. **Table A-3** summarizes these potentially affected stakeholders, and the actions they may be asked to take to help achieve a TMDL.

Table A-3: Potentially Affected Stakeholders and Actions To Achieve TMDLs

Potentially Affected Stakeholders	Actions To Achieve TMDL
Municipal stormwater/wastewater programs	Reduce and treat urban stormwater runoff through stormwater retrofits, replacement of septic tanks
Commercial developers, homebuilders, individual homeowners	Improve development design and construction, enhance best management practices, replace septic tanks
Municipal and industrial wastewater treatment facilities, NPDES-permitted facilities	Reduce pollutant loadings from permitted discharges
Farming and silviculture operations	Reduce and treat runoff through best management practices
Federal, regional, state agencies; regional and local water quality coalitions	Carry out waterbody restoration projects

For additional information on the Department's Watershed Management Program and TMDLs, please contact the following basin coordinators:

- Southwest Florida and Lake Okeechobee, Pat Fricano (850) 245-8559
- Southeast Florida and Ochlockonee-St. Marks Basins, Rick Hicks (850) 245-8558
- Northwest and Central Florida, Mary Paulic, (850) 245-8560
- Northeast Florida and Suwannee Basin, John Abendroth (850) 245-8557
- West Central Florida and Tampa Bay Region, Tom Singleton (850) 245-8561

For information on establishing and implementing TMDLs, contact Jan Mandrup-Poulsen at (850) 245-8448. Additional information is available on the Department's Web site at www.dep.state.fl.us/water/watersheds/index.htm.

Appendix B: Methodology for Determining Impairment Based on the Impaired Surface Waters Rule

In implementing the watershed management approach, the Department relies on environmental data collected by a variety of organizations. Effective project planning, sampling design, raw data review, and data analysis are essential to making accurate determinations of impairment and to TMDL development and implementation.

The Impaired Surface Waters Rule

To identify impaired waters in each of the state's river basins, the Department evaluates water quality data using the science-based methodology in the Impaired Surface Waters Rule (Identification of Impaired Surface Waters Rule, Section 62-303, Florida Administrative Code). The rule establishes specific criteria and thresholds for impairment, in addition to data sufficiency and data quality requirements. The methodology described in the rule is based on a statistical approach designed to provide greater confidence that the outcome of the water quality assessment is correct. The complete text of the Impaired Surface Waters Rule is available at <http://www.dep.state.fl.us/water/tmdl/docs/AmendedIWR.pdf>.

As part of the watershed management approach, for each river basin in the state the Department will follow the methodology in Section 62-303.300, Florida Administrative Code, to develop a Planning List of potentially impaired waters to be assessed under Sections 403.067(2) and (3), Florida Statutes. The methodology for developing the Planning List includes an evaluation of aquatic life use support, primary contact and recreational use support, fish shellfish consumption use support, drinking water use support, and protection of human health. Data older than ten years cannot be used to evaluate water quality criteria exceedances for the Planning List. As required by Section 403.067(2), Florida Statutes, the Planning List will not be used to administer or implement any regulatory program, and is submitted to the U.S. Environmental Protection Agency (EPA) for informational purposes only.

After further assessment, using the methodology in Part III, Section 62-303.400, Florida Administrative Code, the Department will determine if waters on the Planning List are, in fact, impaired and if the impairment is caused by pollutant discharges. These waters are placed on a Verified List. The criteria for the Verified List are more stringent than criteria for the Planning List. Data older than 7 years should not be used to verify impairment. The Verified List will be adopted by Secretarial Order and forwarded to the EPA for approval as Florida's Section 303(d) list of impaired waters. The Department will develop TMDLs for these waters under Section 403.067(4), Florida Statutes.

Attainment of Designated Use(s)

All surface waters of the state are classified according to their designated use, as follows:

Class I: Potable Water Supplies

Class II: Shellfish Propagation or Harvesting

Class III: Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife

Class IV: Agricultural Water Supplies

Class V: Navigation, Utility, and Industrial Use

Based on guidance from the U.S. Environmental Protection Agency (EPA), the Impaired Surface Waters Rule uses a different nomenclature for evaluating attainment of designated uses, as follows:

Aquatic Life Use Support Based Attainment

Primary Contact and Recreation Attainment

Fish and Shellfish Consumption Attainment

Drinking Water Use Attainment and Protection of Human Health

These water quality indicators have been aligned with the state's designated uses, and numeric water quality criteria and biological and nutrient thresholds have been developed for each indicator. A summary of thresholds for each indicator can be found in the 305(b) report at <http://www.dep.state.fl.us/water/305b/index.htm>.

Sources of Data

The assessment of water quality for each basin group statewide includes an analysis of quantitative data from a variety of sources, many of which are readily available to the public. These sources include the U.S. Environmental Protection Agency's (EPA) Legacy and "new" STORage and RETrieval (STORET) databases, the U.S. Geological Survey (USGS), the Department, the Florida Department of Health (DOH), the water management districts, local governments, and volunteer monitoring groups.

Historically, the Department carried out statewide water quality assessments using data available in the EPA's Legacy STORET database; STORET makes up approximately 60 percent of the statewide data used in the 2002 Impaired Surface Waters Rule assessment. The Legacy STORET dataset is a compilation of data collected by numerous organizations that uploaded their data directly to the national database maintained by the EPA until 1999. The Legacy STORET database can be accessed at <http://www.epa.gov/storpubl/legacy/gateway.htm>.

In 2000, the EPA created a "new" STORET database that included modernized features designed to provide an improved repository for data (see the new STORET website at <http://oaspub.epa.gov/storpubl/warehousemenu>). However, because of software difficulties associated with batch uploading of data to the modernized STORET, the data being uploaded to the national repository decreased dramatically, and lingering problems have temporarily reduced STORET's importance as a statewide data source. Modernized STORET comprised only about 5 percent of the 2002 Impaired Surface Waters Rule statewide database.

Approximately 35 percent of the data used in the 2002 Impaired Surface Waters Rule assessment was uploaded from individual organizations that for various reasons were not able to enter their data into the national database. The organizations providing the largest datasets include the South Florida, Southwest Florida, and St. Johns River water

management districts; the USGS; and the University of Florida LakeWatch volunteer monitoring group. Several of these databases are readily available to the public via the Internet: South Florida Water Management District (<http://www.sfwmd.gov/org/ema/dbhydro/index.html>), USGS (<http://fl.water.usgs.gov/>) and LakeWatch (<http://lakewatch.ifas.ufl.edu/>).

The Impaired Surface Waters 2002 database was created to evaluate data simultaneously in accordance with the Impaired Surface Waters Rule methodology for every basin group in the state, based on their appropriate data “window.” For the Verified List assessment, the window is 7 years, and the Planning List assessment window is 10 years. **Table B-1** shows the periods of record for the Verified and Planning lists in the first basin rotation cycle.

The evaluation of water quality in the state’s basin groups also includes some qualitative information. These sources are described in the individual Basin Status Reports and Assessment Reports for each basin group.

Table B-1: Data Used in Developing the Planning and Verified Lists, First Basin Rotation Cycle

Basin Group	Reporting	Period of Data Record Used in Impaired Surface Waters Rule Evaluation
Group 1	Planning List	January 1, 1989 – December 31, 1998
	Verified List	January 1, 1995 – June 30, 2002
Group 2	Planning List	January 1, 1991 – December 31, 2000
	Verified List	January 1, 1996 – December 31, 2002
Group 3	Planning List	January 1, 1992 – December 31, 2001
	Verified List	January 1, 1997 – December 31, 2003
Group 4	Planning List	January 1, 1993 – December 31, 2002
	Verified List	January 1, 1998 – December 31, 2004
Group 5	Planning List	January 1, 1994 – December 31, 2003
	Verified List	January 1, 1999 – December 31, 2005

Notes: Typically, a 10-year data record is used for the development of the Planning Lists, and a 7-year record is used for the Verified Lists. If necessary, however, the data record for the Verified listing can be extended by up to 6 months to complete a monitoring period that will provide sufficient information to make a listing determination. This 6-month extension applies to the development of the 2002 Impaired Surface Waters Rule database.

Methodology

To determine the status of surface water quality in individual river basins in Florida, three categories of data—chemistry data, biological data, and fish consumption advisories—were evaluated to determine potential impairments.

Aquatic Life Based Attainment

To determine the status of surface water quality in individual river basins in Florida, three categories of data—chemistry data, biological data, and fish consumption advisories—were evaluated to determine potential impairments. The Impaired Surface Waters Rule follows the principle of independent applicability. A waterbody is listed for potential impairment of aquatic life use support based on exceedances of any one of four types of water quality indicators (numeric water quality criteria, nutrient thresholds, biological thresholds, and toxicity data).

EXCEEDANCES OF NUMERIC WATER QUALITY CRITERIA

The chemistry data from STORET used in evaluating impairment were also used for preparing the state's 2000 305(b) report. The stations were determined to be ambient surface water quality stations, and water quality information from point sources or wells was purposely excluded. Stations were classified as one of five waterbody types—spring, stream, lake, estuary, or blackwater—based on criteria described in the 305(b) report. The data included the following parameters:

Metals	Arsenic, aluminum, cadmium, chromium VI, chromium III, copper, iron, lead, mercury, nickel, selenium, silver, thallium, and zinc
Nutrients	Chlorophyll <i>a</i> for streams and estuaries, and Trophic State Index (TSI) (chlorophyll <i>a</i> , total nitrogen, and total phosphorus) for lakes
Conventionals	Dissolved oxygen (DO), fecal coliforms, total coliforms, pH, unionized ammonia

The requirements for placing waters on the Planning List included a minimum of ten temporally independent samples from the 10-year period of 1991 through 2000, unless there were three exceedances of water quality or one exceedance of an acute toxicity criterion in a three-year period. The screening methodology for the Verified List requires at least 20 samples from the last 5 years preceding the Planning List assessment. An exceedance, meaning that water quality criteria or standards are not met, is recorded any time the criterion is exceeded by any amount. An exceedance for DO, however, means that a waterbody does not meet the dissolved oxygen criterion, rather than an actual exceedance of the criterion.

To determine if a water should be placed on the Planning List for each parameter, the chemical data were analyzed using a computer program written to assess the data, based on criteria established in the Impaired Surface Waters Rule, with two exceptions. First, unionized ammonia data were not analyzed by the program, but rather with an Excel spreadsheet. Second, because the full complexity of the pH criterion could not be programmed, the incomplete listings for pH are not included. They will be further examined while additional data are collected during Phase 2 of the watershed management cycle. Data analysis and statistical summaries of WBIDs, waterbody types, and parameters obtained from the STORET database were conducted using Access, SAS statistical software, and ArcView GIS applications

The data for metals and conventional parameters were compared with the state surface water quality criteria in Section 62-302.530, Florida Administrative Code. Chapter 62-303 (Identification of Impaired Surface Waters Rule) contains a table of sample numbers versus exceedances. A waterbody was placed on the Planning List if there was at least 80 percent confidence that the actual criteria exceedance rate was greater than or equal to 10 percent. To be placed on the Verified List, at least a 90 percent confidence rate was required.

EXCEEDANCES OF NUTRIENT THRESHOLDS

The state currently has a narrative nutrient criterion instead of a numeric value for nutrient thresholds. The narrative criterion states, “In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna.” The Impaired Surface Waters Rule provides an interpretation of the narrative nutrient criterion. In general, the Trophic State Index (TSI) and the annual mean chlorophyll *a* values are the primary means for assessing whether a waterbody should be assessed further for nutrient impairment.

The rule also considers other information that indicates an imbalance in flora or fauna due to nutrient enrichment, such as algal blooms, excessive aquatic plant growth, a decrease in the distribution (either in density or aerial coverage) of seagrasses or other submerged aquatic vegetation, changes in algal species richness, and excessive diel oxygen swings.

Potential nutrient impairment was evaluated by calculating annual mean chlorophyll *a* values for estuaries and streams and the TSI for lakes. For lakes, the TSI was calculated using chlorophyll *a*, total phosphorus, and total nitrogen measurements. Direct evidence of imbalances of flora and fauna in waterbodies was also considered in the evaluation of nutrient impairments.

In estuarine areas, a water was considered nutrient enriched if the annual mean chlorophyll *a* values were greater than 11 µg/L or if annual mean chlorophyll *a* values increased by more than 50 percent over historical values for at least two consecutive years. For streams, a water was considered nutrient enriched if the annual mean chlorophyll *a* values were greater than 20 µg/L or if the annual mean increased by more than 50 percent over historical values for at least two consecutive years.

A lake with a mean color greater than 40 platinum cobalt units (PCUs) was considered nutrient enriched if the annual mean TSI exceeded 60. A lake with a mean color less than or equal to 40 PCUs was considered nutrient enriched if the annual mean TSI exceeded 40. In addition, a lake was considered nutrient enriched if there was an increase in TSI over the 1989 to 2000 period or if TSI measurements were 10 units higher than historical values.

EXCEEDANCE OF BIOLOGICAL THRESHOLDS

Bioassessments were carried out for freshwater bodies (streams, lakes, canals, and rivers) using the Impaired Surface Waters Rule as guidance and following the Department’s standard operating procedures, which provide definitions and specific methods for the generation and analysis of bioassessment data. These are referenced in the individual bioassessment data tables contained in the Basin Status Reports. The purpose behind using a bioassessment methodology in surface water characterizations is that biological components of the environment manifest long-term water quality conditions and thus provide a better indication of a waterbody’s true health than discrete chemical or physical measurements alone. Similar to water quality criteria, bioassessment methods involve the identification of a biological reference condition, based on data from unimpaired or least impacted waters in a given region.

For the Planning and Verified list assessments, the reference condition data were used to establish expected scores, ranging from best to worst, for various measures of

community structure and function, such as numbers or percentages of particular species or feeding groups. Data on community structure and function from waters of unknown quality in the same region as reference waters were compared with the expected scores of metrics to evaluate their biological integrity.

Metrics (e.g., number of taxa, percent Diptera, percent filter feeders) were used independently and as an aggregated group called an index. Indices have advantages over individual metrics in that they can integrate several related metrics into one score that reflects a wider range of biological variables. A number of bioassessment metrics and indices exist for assessing populations of plant and animal life, including fish, diatoms (e.g., microscopic algae and unicellular plankton), and macroinvertebrates (e.g., insects, crayfish, snails, and mussels).

Only macroinvertebrate data from ambient sites in state surface waters were used in the bioassessments analyzed for the Planning and Verified lists. The data included sites designated as test and background sites for National Pollutant Discharge Elimination System (NPDES) fifth-year inspections, but excluded data from effluent outfalls from discharging facilities or data from monitoring sites not clearly established to collect ambient water quality data. Because site-specific habitat and physicochemical assessment information (e.g., percent suitable macroinvertebrate habitat, water velocities, extent of sand or silt smothering, and riparian (see the sidebar definition) buffer zone widths) was not available at the time of reporting, it was not included. However, this information is instrumental in pinpointing the causes for failed bioassessment metrics and will be included in future reporting.

SIDEBAR DEFINITION: RIPARIAN

Of, on, or relating to the banks of a natural course of water.

The data used to develop the Planning and Verified lists were obtained from the Department's Biological Database (SBIO) and the EPA's STORET Water Quality Database, where it could be substantiated that the data were generated in compliance with the bioassessment standard operating procedures in Section 62-303.330, Florida Administrative Code.

The data from these databases are used without regard to the randomness of sample site selection. The general period of record for data used in the analysis of lotic (moving) waters was January 1, 1991, through December 31, 1998. The period of record for data used in the analysis of lentic (still) waters was June 21, 1995, through December 31, 1998. The June 21st date corresponds to the inception of the Department's current standard operating procedures for sampling lakes (FS-7640). For the purposes of the Basin Status Reports, the seasons are defined as follows: winter (1/1–3/31), spring (4/1–6/30), summer (7/1–9/30), and fall (10/1–12/31). Wet seasons are generally spring and summer, and dry seasons are fall and winter, although conditions can vary in the state as a whole.

LAKE CONDITION INDEX

The scoring of the individual metrics of the Lake Condition Index (LCI), except percent Diptera, was performed according to the following formula:

100(B/A) where A = the 95 percentile of the reference population and B = observed value

For percent Diptera, the following formula was used:

100 (100-B)/(100-A) where A = the 95 percentile of the reference population and B = observed value

An average LCI score was calculated by averaging the scores of the six metrics in the method: total number of taxa; total number of taxa belonging to the orders Ephemeroptera, Odonata, and Trichoptera (EOT taxa); percent EOT taxa; Shannon-Wiener Diversity Index score; Hulbert Index score; and percent Dipteran individuals. LCI calculations were only provided for clear lakes (≤ 20 platinum cobalt units [PCUs]). As macroinvertebrate-based indices have not been shown to assess colored lakes in Florida accurately (> 20 PCUs), they have been excluded from bioassessments. A poor or very poor rating based on the average score constituted a failed bioassessment, based on the Impaired Surface Waters Rule.

STREAM CONDITION INDEX

A total Stream Condition Index (SCI) score was calculated by adding the scores of the seven metrics in the method, i.e., total number of taxa; total number of taxa belonging to the orders Ephemeroptera, Plecoptera, and Trichoptera (EPT taxa); percent Chironomid taxa; percent dominant taxa; percent Diptera; percent filter feeders; and Florida Index. A poor or very poor rating based on the total score constituted a failed bioassessment, based on the Impaired Surface Waters Rule. The Basin Status Reports contain definitions and specific methods for the generation and analysis of bioassessment data.

BIORECON

To establish an impairment rating based on BioRecon data, three metrics were used: the Florida Index score, total number of taxa, and total number of EPT taxa. If all three metrics failed to meet thresholds, the water was deemed “impaired” based on the Impaired Surface Waters Rule.

BIOLOGICAL INTEGRITY STANDARD

Quantitative data, generated through the use of Hester-Dendy artificial substrate samplers, were used to calculate Shannon-Wiener Diversity Index scores for paired background and test sites, as specified in the Biological Integrity Standard of Rule 62-302.530(11), Florida Administrative Code. One failure of the standard meant that a waterbody segment was listed as potentially impaired.

EVALUATION OF TOXICITY DATA

Although the Impaired Surface Waters Rule describes the use of toxicity data for the assessment of aquatic life-based attainment, no ambient toxicity data are available for assessment and this metric was not used.

Primary Contact and Recreation Attainment

For Class I, II, or III waters, a waterbody was potentially impaired if the following criteria were met:

- The waterbody segment did not meet the applicable water quality criteria for bacteriological quality,
- The waterbody segment included a bathing area that was closed by a local health department or county government for more than one week or more than once during a calendar year based on bacteriological data,
- The waterbody segment included a bathing area for which a local health department or county government issued closures, advisories, or warnings totaling twenty-one days or more during a calendar year based on bacteriological data,
- The waterbody segment included a bathing area that was closed or had advisories or warnings for more than twelve weeks during a calendar year based on previous bacteriological data or on derived relationships between bacteria levels and rainfall or flow.

Bathing area closures were also considered in determining attainment of use.

Fish and Shellfish Consumption Attainment

For Class I, II, or III waters, a waterbody was potentially impaired if it did not meet the applicable Class II water quality criteria for bacteriological quality, or if a fish consumption advisory had been issued. Fish consumption advisories were based on the Florida Department of Health's "limited consumption" or "no consumption" advisories for surface waters because of high levels of mercury in fish tissue. In addition, for Class II waters, waterbody segments that had been approved for shellfish harvesting but were downgraded to a more restrictive classification were listed as potentially impaired.

Drinking Water Attainment and Protection of Human Health

For Class I waters, a waterbody was potentially impaired if it did not meet the applicable Class I water quality criteria.

Appendix C: Bioassessment Supporting Data for the St. Lucie and Loxahatchee Basin Group

Methodology

An increasingly accepted tool for evaluating the biological integrity of surface water is bioassessment. The premise behind using bioassessment methodology in surface water characterizations is that biological components of the environment manifest long-term water quality conditions and can presumably give a better indication of the true health of the waters involved than discrete chemical or physical measurements alone.

Similar to water quality criteria, bioassessment methods involve the identification of a biological reference condition, based upon data from unimpaired or least impacted waters in a give region. The reference condition data are used to establish expected scores, ranging from best to worst, for various measures of community structure and function, such as numbers or percentages of particular species or feeding groups. Community structure and function data from waters of unknown quality within the same region as reference waters are compared with the expected scores of metrics to evaluate their biological integrities. Metrics may be used independently or as an aggregated group called an index. Indices have advantages over individual metrics in that they can integrate several related metrics into one score that reflects a wider range of biological variables. A number of bioassessment metrics and indices exist for assessing populations of plant and animal life, including fish, diatoms, and macroinvertebrates.

Only macroinvertebrate data are included in the following bioassessments. Because site-specific habitat and physicochemical assessment information (e.g., percent suitable macroinvertebrate habitat, water velocities, extent of sand or silt smothering, and riparian buffer zone widths) were not available at the time of reporting, it is not included here. However, habitat and physicochemical assessment information is instrumental in pinpointing the causes for failed bioassessment metrics and should be included in future reporting.

Data used in this report were obtained from the Department's Biological Database (SBIO) and the EPA's STORET Water Quality Database, where in could be substantiated that such data were generated in compliance with the bioassessment standard operating procedures reference in Rule 62-303.330, Florida Administrative Code (the impaired surface waters rule). Bioassessments are provided from streams, canals, rivers with data generated according to Department standard operating procedure FS-7420 and FS-7430 and analyzed according to the Stream Condition Index (SCI) for Florida (Barbour *et al.*, 1996; FDEP SOP #LT-7200) and/or Section 62-302.530(11), Florida Administrative Code (Biological Integrity Standard). Bioassessments are also provided for clear lakes (≤ 20 platinum cobalt units) with data generated according to Department standard operating procedure FS-6460 and analyzed according to the Lake Condition Index (LCI) for Florida (Gerritsen *et al.*, 2000; FDEP SOP #LT-7300). Since macroinvertebrate-based indices have not been shown to assess colored lakes in Florida accurately (>20 platinum cobalt units), they have been excluded from the following bioassessments.

Only ambient data from state surface waters were used in the following bioassessments, excluding data from effluent outfalls from discharging facilities or data from monitoring sites not clearly established to collect ambient water quality data. Data

were used from the databases noted above without regard to the randomness of sample site selection. The general period of record for data used in this assessment was from January 1992 through April 2002.. The beginning corresponds to the inception of the current Department standard operating procedure for sampling lakes (FS-7600). For the purposes of this report, the seasons are defined as follows; winter (1/1-3/31), spring (4/1-6/30), summer (7/1-9/30) and fall (10/1-12/31). Wet seasons are generally spring and summer and dry seasons are fall and winter, although conditions can vary within the state as a whole.

Metric Definitions

of Taxa—This metric is otherwise known as taxa richness. In this report, it indicates the total number of macroinvertebrate taxa found in a sample of stream or lake bottom, other in-water substrate such as fallen branches or roots, or artificial surface in the waterbody for invertebrate colonization. A taxon (singular) is a group of organisms with common traits and characteristics, such as dragonflies (taxon Odonata). As the environment is stressed, the number of taxa generally decreases.

of Chironomid Taxa—Chironomids are larval flies that are prevalent in many surface waters. This metric is also a measure of taxa richness.

of EPT or EOT Taxa—Particular organisms or groups of organisms in a given surface water habitat are more sensitive to changes in the environment than others, making them good indicators of environmental stress. Mayflies (Ephemeroptera), stoneflies (Plecoptera), caddisflies (Trichoptera), and dragonflies and damselflies (Odonata) are four such taxa.

% Diptera—Dipterans are larval flies, many of which are tolerant of poor water quality conditions. This metric represents the fraction of the total number of dipteran organisms in a sample. A large fraction indicates an invertebrate community that is predominantly tolerant of low water quality.

Florida Index—The Florida Index is a weighted measurement of the numbers of Class I and Class II macroinvertebrate species known in Florida. It assigns points to stream-dwelling macroinvertebrates based on their sensitivities to pollution. It is an index in itself, but the results can be incorporated into other indices as measurements of biological integrity.

% Filter Feeders—Filter-feeding organisms indicate the flow regime in a waterbody. The larger the fraction of the total community consisting of filter feeders, the more likely it is that the waterbody has a good flow regime.

% Dominant Taxon—In all waterbodies, the taxon that exists in greater number than all others is known as the dominant taxon. A high percentage of dominant taxon in a sample indicates lower diversity and poorer water quality.

Shannon-Wiener Diversity Index—This is a measurement of macroinvertebrate community health, which is specified in Florida Rule 62-302, Florida Administrative Code. It incorporates level of taxa richness (how many taxa are present) within the distribution of individuals among taxa present (how evenly they are distributed). Like the Florida Index, it is an index in itself. However, the result is often included in other indices of biological integrity. Low diversity scores are indicative of conditions where only a few species are present to the exclusion of other taxa.

Hulbert Index—This index is also a weighted measurement of the numbers of Class A and Class B species of macroinvertebrates known in Florida lakes. It is also an index in itself, but the result is included in the calculation of the Lake Condition Index as a separate metric value. No lakes were assessed in this area.

Bioassessment by Basin Planning Unit

Tables C-1A and C-1B contain the results of Stream Condition Index (SCI) and an example of the SCI scoring and evaluation worksheet. **Table C-2** provides the analysis of Biorecon data. **Table C-3** contains selected results from artificial substrate analyses (Hester-Dendy analyses). **Table C-4** summarizes the results of all bioassessment tests with determinations of compliance with applicable state water quality rules. All tests employed and data analyzed are based on measurements of surface water macroinvertebrate community integrity. All data used were generated by the Department according to its standard operating procedures.

References

- Barbour, M.T., J. Gerrisen, and J.S. White. 1996. *Development of the Stream Condition Index (SCI) for Florida*. Prepared for the Florida Department of Environmental Protection. Owings Mills, Maryland: Tetra Tech, Inc.
- Gerritsen, J., B. Jessup, E. Leppo, and J. White. 2000. *Development of Lake Condition Indexes (LCI) for Florida*. Owings Mills, Maryland: Tetra Tech, Inc.

Table C-1A: Bioassessment Summary for the St. Lucie and Loxahatchee Basin Group for the Period January 1992 through April 2002.
(Florida Department of Environmental Protection Standard Operating Procedure # FS-7420 and # LT-7200).

Waterbody	WBID	Planning		STORET Station #	Sample Date	# of # of EPT		# of Chironomid		FL Index Score ^b	% Filter Feeders	% Dominant Taxon	Dominant Taxon
		Unit				Taxa ^a	Taxa	Taxa	% Diptera				
C-18 CNL AT BEND TO NE. W JPTER	3234	Loxahatchee		2.8E+07	8/20/97	44	2	10	54.82	4	8.99	15.79	Tanytarsus sp. epler
Canal L4 discharges into NW fork Lox Rv.	3230	Loxahatchee		2.8E+07	8/20/97	36	1	10	37.33	5	8.29	21.66	Dero trifida
L2 canal discharges to NW fork Lox Rv	3230	Loxahatchee		2.8E+07	8/20/97	32	1	11	63.49	3	1.72	30.42	Palpomyia/bezzia grp.
L7 canal upstrm NW fork Lox Rv	3234	Loxahatchee		2.8E+07	8/20/97	35	1	15	36.31	3	12.82	23.92	Pyrgophorus platyrachis
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee		2.8E+07	8/20/92	26	2	7	14.93	5	13.81	38.06	Caenis diminuta
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee		2.8E+07	2/17/93	35	3	11	41.76	17	30.22	25.27	Rheotanytarsus
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee		2.8E+07	8/25/94	30	4	7	60.96	7	51.71	28.77	Rheotanytarsus
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee		2.8E+07	9/22/95	30	2	10	52.17	10	31.3	18.26	Simulium
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee		2.8E+07	2/20/96	26	2	14	45.96	13	26.09	26.09	Microcylloepus
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee		2.8E+07	8/8/96	43	6	19	43.3	15	24.62	24.9	Microcylloepus pusillus
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee		2.8E+07	2/20/97	43	6	19	46.32	22	23.38	17.32	Microcylloepus pusillus
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee		2.8E+07	8/9/97	30	3	10	20	5	33.06	34.44	Pyrgophorus platyrachis
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee		2.8E+07	2/21/98	38	11	11	35.39	23	35.96	15.73	Rheotanytarsus exiguus grp.
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee		2.8E+07	9/21/98	36	2	8	21.7	0	2.36	14.15	Ferrissia hendersoni/Hyalella azteca
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee		2.8E+07	3/22/99	25	2	7	31.65	5	3.48	15.82	Hyalella azteca

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NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3224A	Loxahatchee	2.8E+07	10/7/99	30	3	12	56.45	13	28.23	12.9	Baetidae/Polypedium illinoense grp.
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3226D	Loxahatchee	2.8E+07	8/20/92	27	2	7	16.31	7	13.16	36.17	Caenis diminuta
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	8/20/92	29	5	11	35	7	13	18	Caenis
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	8/20/92	27	5	11	37.11	7	19.59	18.56	Caenis diminuta
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	2/16/93	37	4	11	51.52	15	42.84	18.6	Plisidium
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	8/11/93	46	6	14	9.62	17	5.79	47.31	Pyrgophorus platyrachis
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	9/20/95	29	4	18	33.96	10	10.85	19.81	Hyalella azteca
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	2/20/96	33	5	14	49.46	15	26.77	25	Hydrobiidae
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	8/6/96	28	3	13	46.03	12	22.62	25.4	Pyrgophorus platyrachis
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	2/21/97	39	2	15	28.79	11	10.61	22.73	Pyrgophorus platyrachis
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	8/8/97	36	5	13	45.63	18	20.39	11.65	Polypedium illinoense grp.
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	2/21/98	44	6	22	36.84	20	21.49	36.84	Pyrgophorus platyrachis
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	9/21/98	27	7	6	21	7	5	26	Pyrgophorus platyrachis
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	3/22/99	21	3	7	23.42	10	19.82	44.14	Pyrgophorus platyrachis
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	10/7/99	18	2	8	26.6	9	6.91	51.06	Pyrgophorus platyrachis
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	7/7/00	18	2	5	8.42	6	8.42	56.84	Pyrgophorus platyrachis

Savanna Preserve Stormwater Impact Monitor Site	3194C	North St. Lucie	2.8E+07	10/26/95	32	1	13	48	1	6.5	16	Dero botrytis
Savanna Preserve Stormwater Impact Monitor Site	3194C	North St. Lucie	2.8E+07	1/11/96	34	2	11	42.35	2	3.53	15.29	Dero nivea
Savanna Preserve Stormwater Impact Monitor Site	3194C	North St. Lucie	2.8E+07	4/2/96	43	2	13	41.96	3	4.12	12.16	Micromenetus dilatatus
Savanna Preserve Stormwater Impact Monitor Site	3194C	North St. Lucie	2.8E+07	7/16/96	33	1	12	42.86	4	0.34	23.81	Dero furcata
Savanna Reserve @ EPSL stormwater slouth mouth	3194C	North St. Lucie	2.8E+07	1/19/96	28	4	16	53.85	8	12.82	23.08	Hyaella azteca
Savanna Reserve @ EPSL stormwater slouth mouth	3194C	North St. Lucie	2.8E+07	4/18/96	32	4	11	28.07	5	6.14	30.7	Hyaella azteca
Savanna Reserve @ EPSL stormwater slouth mouth	3194C	North St. Lucie	2.8E+07	7/17/96	23	2	9	64.29	7	7.14	21.43	Pseudochironomus
Savanna Reserve @ GDC Illegal Causeway	3194C	North St. Lucie	2.8E+07	10/20/95	31	3	9	20.81	7	2.35	24.83	Hyaella azteca
Savanna Reserve @ GDC Illegal Causeway	3194C	North St. Lucie	2.8E+07	1/10/96	23	4	12	22.29	7	6	60	Hyaella azteca
Savanna Reserve @ GDC Illegal Causeway	3194C	North St. Lucie	2.8E+07	4/12/96	28	3	14	22.67	10	0.58	56.98	Hyaella azteca
Savanna Reserve @ mouth of Hogpen Slough	3194C	North St. Lucie	2.8E+07	10/19/95	32	2	13	39.04	4	3.77	25.34	Dero nivea
Savanna Reserve @ mouth of Hogpen Slough	3194C	North St. Lucie	2.8E+07	1/31/96	41	5	19	43.66	7	5.04	10.07	Ancylidae/Hyaella azteca
Savanna Reserve @ mouth of Hogpen Slough	3194C	North St. Lucie	2.8E+07	4/11/96	29	4	10	35.05	4	0.52	18.56	Hyaella azteca
Savanna Reserve @ mouth of Hogpen Slough	3194C	North St. Lucie	2.8E+07	7/24/96	36	2	16	54.95	6	3.6	10.81	Coenagrionidae
Savanna Reserve @ southwest end of marsh	3194B	North St. Lucie	2.8E+07	10/23/95	25	5	13	44.09	4	2.76	25.2	Oxyethira
Savanna Reserve @ southwest end of marsh	3194B	North St. Lucie	2.8E+07	4/19/96	28	4	14	43.18	8	3.79	24.24	Hyaella azteca
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	10/19/95	27	2	6	7.35	7	0.37	25	Oxyethira
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	1/31/96	32	3	14	33.5	9	9.47	44.17	Hyaella azteca
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	4/11/96	19	4	8	40.71	6	11.06	32.74	Hyaella azteca

Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	7/24/96	23	5	9	31.68	6	3.96	48.51	Hyaella azteca
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	6/13/97	32	4	17	51.39	4	5.9	11.81	Parakiefferiella
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	10/21/97	28	4	13	39	9	6	36	Hyaella azteca
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	2/10/98	35	4	16	47.16	8	15.91	24.43	Hyaella azteca
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	5/7/98	32	5	16	52.31	12	11.54	25.64	Hyaella azteca
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	8/12/98	31	2	14	39.16	9	5.59	23.08	Dero digitata
Savanna Reserve at Bartow St canal in marsh	3194C	North St. Lucie	2.8E+07	10/16/95	35	0	13	41.11	3	3.06	12.22	Larsia berneri
Savanna Reserve at Bartow St canal in marsh	3194C	North St. Lucie	2.8E+07	1/19/96	38	3	16	63.43	9	4.63	9.72	Dasyhelea
Savanna Reserve at Bartow St canal in marsh	3194C	North St. Lucie	2.8E+07	4/4/96	37	2	15	46.19	5	1.02	27.92	Hyaella azteca
Savanna Reserve at Bartow St canal in marsh	3194C	North St. Lucie	2.8E+07	7/15/96	33	1	10	38.61	2	0.5	15.84	Dero furcata
Savanna Reserve at mouth of Savanna disch ditch	3194C	North St. Lucie	2.8E+07	10/20/95	31	4	9	33.61	8	0.84	18.49	Hyaella azteca
Savanna Reserve at mouth of Savanna disch ditch	3194C	North St. Lucie	2.8E+07	4/12/96	32	2	17	38.74	7	6.76	37.84	Hyaella azteca
Savanna Reserve at mouth of Savanna disch ditch	3194C	North St. Lucie	2.8E+07	7/18/96	42	4	15	31.15	6	4.1	27.87	Hyaella azteca
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	10/16/95	32	2	8	34.35	5	5.73	19.08	Dero nivea
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	1/19/96	40	4	13	71.79	8	11.61	18.57	Dicrotendipes leucoscelis
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	4/4/96	32	5	10	19.65	8	4.62	34.68	Hyaella azteca
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	7/15/96	40	4	14	42.42	7	5.56	19.19	Hyaella azteca
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	6/13/97	35	4	12	38.64	7	4.26	14.77	Pseudochironomus
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	10/20/97	29	3	11	60.19	4	4.37	10.68	Larsia berneri

Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	2/9/98	38	4	17	68	9	15.33	19.11	Tanytarsus sp. c epler
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	5/5/98	43	4	18	40.05	8	4.44	29.74	Hyaella azteca
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	8/11/98	35	3	13	59.87	4	4.78	15.29	Pseudochironomus
Savanna Reserve near EPSL discharge	3194C	North St. Lucie	2.8E+07	10/20/95	35	2	15	47.46	7	1.98	18.08	Parachironomus alatus
Savanna Reserve near EPSL discharge	3194C	North St. Lucie	2.8E+07	1/11/96	40	5	13	33.48	7	8.82	12.67	Tanytarsus sp. c epler
Savanna Reserve near EPSL discharge	3194C	North St. Lucie	2.8E+07	4/18/96	39	2	12	32.86	5	8.93	11.43	Oxyethira/Bratislava unidentata
Savanna Reserve near EPSL discharge	3194C	North St. Lucie	2.8E+07	7/17/96	38	2	12	55.06	2	5.06	19.66	Pseudochironomus
Savanna Reserve near Howard St disch canal mouth	3194C	North St. Lucie	2.8E+07	10/26/95	40	1	14	23.72	3	5.84	44.16	Trichocorixa sexcincta
Savanna Reserve near Howard St disch canal mouth	3194C	North St. Lucie	2.8E+07	1/11/96	33	3	12	63.36	3	5.86	15.62	Dero nivea
Savanna Reserve near Howard St disch canal mouth	3194C	North St. Lucie	2.8E+07	4/2/96	35	3	11	36.7	5	2.29	22.48	Hyaella azteca
Savanna Reserve near Howard St disch canal mouth	3194C	North St. Lucie	2.8E+07	7/16/96	33	4	13	50.49	6	1.46	9.71	Polypedilum sp. a epler
Savanna Reserve north of Illegal Causeway	3194C	North St. Lucie	2.8E+07	10/20/95	27	3	8	15.97	3	0.42	32.77	Hyaella azteca
Savanna Reserve north of Illegal Causeway	3194C	North St. Lucie	2.8E+07	1/10/96	27	4	11	28.89	8	9.78	44.44	Hyaella azteca
Savanna Reserve north of Illegal Causeway	3194C	North St. Lucie	2.8E+07	4/12/96	28	4	14	23.81	11	5.24	51.43	Hyaella azteca
Savanna Reserve north of Illegal Causeway	3194C	North St. Lucie	2.8E+07	7/18/96	30	4	13	28.69	9	3.28	38.52	Hyaella azteca
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	1/19/96	38	6	15	41.71	10	9.55	28.64	Hyaella azteca
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	4/18/96	22	4	10	39.84	6	12.89	39.06	Hyaella azteca
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	7/17/96	24	5	8	47.97	5	6.91	28.46	Hyaella azteca
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	6/10/97	44	3	20	47.08	9	10.39	14.94	Dero digitata

Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	10/20/97	36	3	19	54.97	9	5.56	15.79	Parachironomus alatus
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	2/9/98	43	5	17	44.55	6	4.5	18.96	Hyaella azteca
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	5/5/98	34	3	16	62.07	6	9.48	12.07	Pseudochironomus
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	8/12/98	35	2	15	40.77	7	4.62	26.92	Dero furcata
Savanna Reserve S of Scott St in IR Estates	3194C	North St. Lucie	2.8E+07	10/13/95	42	1	12	23.74	2	2.52	11.51	Laevapex peninsulae
Savanna Reserve S of Scott St in IR Estates	3194C	North St. Lucie	2.8E+07	1/4/96	38	4	12	43.2	4	5.92	15.98	Hyaella azteca
Savanna Reserve S of Scott St in IR Estates	3194C	North St. Lucie	2.8E+07	7/15/96	36	4	13	32.71	6	2.34	14.95	Hyaella azteca
Savanna Reserve South of Hogpen Slough mouth	3194C	North St. Lucie	2.8E+07	10/19/95	31	3	10	16.93	6	3.44	41.8	Hyaella azteca
Savanna Reserve South of Hogpen Slough mouth	3194C	North St. Lucie	2.8E+07	1/31/96	25	4	7	10.65	7	1.16	75.93	Hyaella azteca
Savanna Reserve South of Hogpen Slough mouth	3194C	North St. Lucie	2.8E+07	4/11/96	31	5	12	22.73	9	3.25	53.25	Hyaella azteca
Savanna Reserve South of Hogpen Slough mouth	3194C	North St. Lucie	2.8E+07	7/24/96	21	2	11	35.77	7	2.85	46.34	Hyaella azteca
Savanna Reserve south of Walton Road	3194C	North St. Lucie	2.8E+07	10/20/95	36	5	13	44.76	10	8.1	16.67	Parachironomus alatus
Savanna Reserve south of Walton Road	3194C	North St. Lucie	2.8E+07	1/11/96	26	3	13	52.69	8	12.87	19.76	Hyaella azteca
Savanna Reserve south of Walton Road	3194C	North St. Lucie	2.8E+07	7/17/96	28	5	12	62.59	10	9.35	15.83	Pseudochironomus
Savanna Reserve west of Lake Eden	3194C	North St. Lucie	2.8E+07	10/27/95	37	6	9	32.79	8	3.28	12.3	Hyaella azteca
Savanna Reserve west of Lake Eden	3194C	North St. Lucie	2.8E+07	1/29/96	42	5	15	28.31	8	2.02	28.68	Hyaella azteca
Savanna Reserve west of Lake Eden	3194C	North St. Lucie	2.8E+07	4/19/96	29	4	15	47.47	7	8.59	31.31	Hyaella azteca
Savanna Reserve west of Lake Eden	3194C	North St. Lucie	2.8E+07	7/25/96	37	3	13	57.64	9	3.47	18.75	Parachironomus alatus
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	10/13/95	29	1	13	11.38	2	1.03	28.28	Dero nivea

Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	1/4/96	37	3	14	30.57	3	3.71	33.62	Hyaella azteca
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	4/4/96	33	5	13	42.47	7	9.36	21.46	Hyaella azteca
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	7/15/96	29	4	12	21.26	9	5.51	44.09	Hyaella azteca
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	6/13/97	38	4	12	35.14	7	5.41	21.62	Dero nivea
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	10/20/97	56	3	18	61.66	5	9.59	15.89	Tanytarsus sp. c epler
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	2/9/98	25	3	9	56.12	3	15.31	27.55	Cladotanytarsus
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	5/5/98	44	6	17	51.98	11	12.15	16.38	Hyaella azteca
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	8/11/98	27	0	8	39.62	3	6.6	25.47	Bratislavia unidentata
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	10/19/95	23	3	10	21.71	4	2.63	28.29	Hyaella azteca
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	1/31/96	35	5	14	30.88	8	12.01	29.41	Hyaella azteca
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	4/11/96	27	3	9	22.5	8	3.13	51.25	Hyaella azteca
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	6/13/97	36	5	13	70.63	7	18.65	26.19	Dicrotendipes
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	10/21/97	30	4	14	39.53	8	9.69	21.71	Hyaella azteca
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	2/10/98	32	5	12	19.38	8	5.63	31.25	Caenis diminuta
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	5/7/98	33	2	14	24.68	11	2.85	35.44	Hyaella azteca
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	8/12/98	33	2	12	51.28	5	3.85	25.64	Dasyhelea
SAVANNAHS AT WHITE CITY	3194C	North St. Lucie	2.8E+07	10/13/95	37	2	13	24.17	5	2.5	24.17	Dero nivea
SAVANNAHS AT WHITE CITY	3194C	North St. Lucie	2.8E+07	1/12/96	30	3	13	61	6	18.5	17	Tanytarsus sp. c epler
SAVANNAHS AT WHITE CITY	3194C	North St. Lucie	2.8E+07	4/2/96	30	3	15	44.68	7	8.51	19.86	Oxyethira
SAVANNAHS AT WHITE CITY	3194C	North St. Lucie	2.8E+07	7/16/96	34	4	12	40.83	7	3.33	23.33	Caenis diminuta
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	8/26/92	63	4	18	21.87	13	5.35	35.08	Caenis diminuta
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	2/25/93	28	1	9	8.25	8	7.73	24.74	Hyaella azteca
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	8/17/93	38	3	11	18.35	5	12.66	19.3	Caenis diminuta

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SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	2/23/94	47	5	21	22	13	8.96	27.66	Hyalella azteca
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	9/21/95	35	2	14	25.81	7	1.61	25.27	Cassidinidea ovalis
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	2/21/96	26	2	6	24.47	7	25	15.96	Pisidiidae
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	8/7/96	35	1	17	13.82	7	19.31	31.71	Pyrgophorus platyrachis
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	2/26/97	26	2	10	15.72	6	31.45	29.56	Pisidiidae
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	8/6/97	35	3	13	43.68	5	12.93	20.69	Hyalella azteca
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	2/21/98	53	5	24	30.55	16	40.73	28.73	Pisidiidae
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	8/31/98	34	4	10	13.35	5	25.26	35.34	Pyrgophorus platyrachis
SOUTH FORK ST. LUCIE RIVER	3210	South St. Lucie	2.8E+07	8/26/92	61	4	17	22.73	13	6.02	35	Caenis diminuta
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	2/23/94	50	5	22	16.97	22	40.54	30.44	Pisidiidae
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	9/21/95	42	3	14	38.07	6	13.94	18.77	Goeldichironomus fluctuans
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	2/21/96	39	3	16	26.88	7	36.41	21.25	Pisidiidae
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	8/7/96	37	3	23	49.13	17	15.87	16.09	Pyrgophorus platyrachis
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	2/26/97	27	4	10	15.66	9	12.35	24.1	Exosphaeroma
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	8/20/97	38	4	19	31.78	16	20.33	21.96	Pyrgophorus platyrachis
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	2/21/98	19	3	4	5.83	2	11.65	33.01	Gammarus
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	8/31/98	39	3	16	20.25	13	15.95	19.02	Pyrgophorus platyrachis
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	3/24/99	28	3	10	6.36	9	15.91	34.09	Gammarus
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	11/3/99	51	4	20	32.13	15	29.62	17.27	Eupera cubensis

South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	6/20/00	26	0	9	19.85	6	21.76	26.72	Pyrgophorus platyrachis
TEN MI CREEK, test for Indian River Foods FYI	3194A	North St. Lucie	2.8E+07	1/12/93	31	1	10	33.14	3	2.62	11.63	Tubifex tubifex/Limnodrilus hoffmeisteri
TEN MILE CREEK, ref for Indian River Foods FYI	3194A	North St. Lucie	2.8E+07	1/12/93	27	0	8	42.4	4	4.8	17.6	Polypedium illinoense
Unnamed canal, ref for TriGas FYI	3234	Loxahatchee	2.8E+07	8/23/93	42	2	17	72.24	6	3.51	21.4	Pseudochironomus
Unnamed canal, test for TriGas FYI	3234	Loxahatchee	2.8E+07	8/23/93	35	1	13	70.85	3	4.38	32.35	Larsia decolorata

^a Total number of invertebrate taxa in the orders Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies). Otherwise known as the EPT Index.

^b Florida Index score. Methods per Ross, L. T. 1990. Methods for Aquatic Biology. Florida Department of Environmental Regulation. Technical Series 10(1):1-47, Tallahassee, Florida.

^c Stream Condition Index score and evaluation, per method shown for peninsular Florida in Table 2. and Barbour, M. T., J. Gerritsen, and J.S. White. 1996. Development of the Stream Condition Index (SCI) for Florida. Prepared for the Florida Dept. of Environmental Protection. Tetra Tech, Inc.. Owings Mills, Maryland.

Table C-1B: Stream Condition Index (SCI) Scoring and Evaluation Worksheet

Summer Index Period (May-October): Stream Condition Index for Florida (SCI)												
Macroinvertebrate Dipnet (20 sweeps of most productive substrates)	Value			Panhandle			Peninsula			Northeast		
	5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa	≥ 31	30-16	< 16		≥ 26	25-14	< 14		≥ 22	21-12	< 12	
EPT Index	≥ 7	6-4	< 4		≥ 4	3-2	< 2		----	≥ 2	< 2	
# Chironomid Taxa	≥ 9	8-5	< 5		≥ 7	6-4	< 4		≥ 7	6-4	< 4	
% Contribution of Dominant Taxon	≤ 22	23-61	> 61		≤ 29	30-64	> 64		≤ 31	32-66	> 66	
% Diptera	----	≤ 50	> 50		----	≤ 37	> 37		----	≤ 47	> 47	
Florida Index	≥ 16	15-8	< 8		≥ 7	6-4	< 4		≥ 8	7-5	< 5	
% Suspension Feeders/Filterers	≥ 12	11-6	< 6		----	≥ 7	< 7		----	≥ 7	< 7	
Total Score												
Evaluation		Excellent		27-33		Excellent		26-31		Excellent		25-29
		Good		21-26		Good		20-25		Good		19-24
		Poor		14-20		Poor		13-19		Poor		13-18
		Very Poor		7-13		Very Poor		7-12		Very Poor		7-12
Winter Index Period (November-April): Stream Condition Index for Florida (SCI)												
Macroinvertebrate Dipnet (20 sweeps of most productive substrates)	Value			Panhandle			Peninsula			Northeast		
	5	3	1	Score	5	3	1	Score	5	3	1	Score
Total Number of Taxa	≥ 27	26-14	< 14		≥ 27	26-14	< 14		≥ 18	17-9	< 9	
EPT Index	≥ 6	5-3	< 3		≥ 4	3-2	< 2		----	≥ 3	< 3	
# Chironomid Taxa	≥ 9	8-5	< 5		≥ 9	8-5	< 5		≥ 4	3-2	< 2	
% Contribution of Dominant Taxon	≤ 25	26-62	> 62		≤ 30	31-65	> 65		≤ 37	38-69	> 69	
% Diptera	----	≤ 60	> 60		----	≤ 52	> 52		----	≤ 67	> 67	
Florida Index	≥ 13	12-7	< 7		≥ 10	9-5	< 5		≥ 6	5-3	< 3	
% Suspension Feeders/Filterers	≥ 13	12-7	< 7		≥ 15	14-8	< 8		≥ 25	25-13	< 13	
Total Score												
Evaluation		Excellent		27-33		Excellent		27-33		Excellent		26-31
		Good		21-26		Good		21-26		Good		20-25
		Poor		14-20		Poor		14-20		Poor		14-19
		Very Poor		7-13		Very Poor		7-13		Very Poor		7-13

Table C-2: Analysis of Biorecon Data from Samples Taken in the St. Lucie and Loxahatchee Basin Group for the Period January 1992 through April 2002.

Waterbody	WBID	Planning Unit	STORET Station #	Sample Date	# of Taxa		FL Index ^a		# of EPT Taxa ^b		Overall Evaluation
					Score		Score		Score		
Jenkins Canal at culvert	3224B	Loxahatchee	28010346	7/21/98	15	failed	0	failed	1	failed	Impaired
Jenkins Canal at culvert	3224B	Loxahatchee	28010346	11/24/98	10	failed	1	failed	0	failed	Impaired
Kitching Creek	3224B	Loxahatchee	28010347	7/21/98	22	passed	5	failed	2	failed	Suspect
Kitching Creek	3224B	Loxahatchee	28010347	11/24/98	18	passed	4	failed	2	failed	Suspect
Kitching Creek at USGS site	3224B	Loxahatchee	28010348	7/21/98	18	passed	7	failed	1	failed	Suspect
Kitching Creek at USGS site	3224B	Loxahatchee	28010348	11/24/98	19	passed	4	failed	2	failed	Suspect

^a Florida Index score. Methods per Ross, L. T. 1990. Methods for Aquatic Biology. Florida Department of Environmental Regulation. Technical Series 10(1):1-47, Tallahassee, Florida.

^b Total number of taxa in the invertebrate orders Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies).

Note: Collection method (FDEP SOP # FS-7410 and # LT-7100).

Table C-3: Analysis of Macroinvertebrate Data from Samples Taken in the St. Lucie and Loxahatchee Basin by the Hester-Dendy Artificial Substrate Sample Collection Method
(Florida Department of Environmental Protection Standard Operating Procedure # FS-7430 and Section 62-302.530[11], Florida Administrative Code)

Waterbody	WBID	Planning Unit	Control Site STORET Station #	Test Site STORET Station #	Sample Date	Control Site Shan/Wiener Score ^a	Test Site Shan/Wiener Score ^a	Rule 62-302.530(11) F.A.C. Meets Criteria ^b
TEN MILE CREEK for Indian River Foods FYI	3194A	North St. Lucie	28010232	28010611	1/12/93	0.42	1.14	yes (passed)
Unnamed canal for TriGas FYI	3234	Loxahatchee	28010233	28010234	8/23/93	2.87	2.25	yes (passed)

^a Shannon-Wiener Diversity Index score. Methods based upon Pielou, E. 1977. *Mathematical Ecology*. John Wiley and Sons, Inc., New York, New York.

^b Only test sites with associated background sites were evaluated.

^a Shannon-Wiener Diversity Index score. Methods based on Pielou, E. 1977. *Mathematical Ecology*. New York: John Wiley and Sons.

^b Based on Friedemann, M and J. Hand. 1989. *Typical Water Quality Values for Florida's Lakes, Streams, and Estuaries*. Tallahassee, Florida: Florida Department of Environmental Regulation,.

Table C-4: Bioassessment Summary for the St. Lucie and Loxahatchee Basin Group for the Period January 1992 through April 2002. method (FDEP SOP # FS-7420 and # LT-7200).

Waterbody	WBID	Planning Unit	STORET Station #	Sample Date	# of Taxa	# of EPT Taxa ^a	# of Chironomid Taxa ^a		FL Index Score ^b	% Filter Feeders	% Dominant Taxon	Dominant Taxon	SCI ^c	
							Taxa ^a	% Diptera					Score	Evaluation
C-18 CNL AT BEND TO NE. W JPTER	3234	Loxahatchee	2.8E+07	8/20/97	44	2	10	54.82	4	8.99	15.79	Tanytarsus sp. epler	25	Good
Canal L4 dishcarches into NW fork Lox Rv.	3230	Loxahatchee	2.8E+07	8/20/97	36	1	10	37.33	5	8.29	21.66	Dero trifida	25	Good
L2 canal discharges to NW fork Lox Rv	3230	Loxahatchee	2.8E+07	8/20/97	32	1	11	63.49	3	1.72	30.42	Palpomyia/bezzia grp.	17	Poor
L7 canal upstrm NW fork Lox Rv	3234	Loxahatchee	2.8E+07	8/20/97	35	1	15	36.31	3	12.82	23.92	Pyrgophorus platyrachis	23	Good
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee	2.8E+07	8/20/92	26	2	7	14.93	5	13.81	38.06	Caenis diminuta	25	Good
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee	2.8E+07	2/17/93	35	3	11	41.76	17	30.22	25.27	Rheotanytarsus	31	Excellent
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee	2.8E+07	8/25/94	30	4	7	60.96	7	51.71	28.77	Rheotanytarsus	29	Excellent
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee	2.8E+07	9/22/95	30	2	10	52.17	10	31.3	18.26	Simulium	27	Excellent
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee	2.8E+07	2/20/96	26	2	14	45.96	13	26.09	26.09	Microcylloepus	29	Excellent
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee	2.8E+07	8/8/96	43	6	19	43.3	15	24.62	24.9	Microcylloepus pusillus	29	Excellent
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee	2.8E+07	2/20/97	43	6	19	46.32	22	23.38	17.32	Microcylloepus pusillus	33	Excellent
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee	2.8E+07	8/9/97	30	3	10	20	5	33.06	34.44	Pyrgophorus platyrachis	25	Good
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee	2.8E+07	2/21/98	38	11	11	35.39	23	35.96	15.73	Rheotanytarsus exiguus grp.	33	Excellent
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee	2.8E+07	9/21/98	36	2	8	21.7	0	2.36	14.15	Ferrissia hendersoni/Hyalella azteca	23	Good
N FK LOXAHATCHEE RIVER REF BIO STATION	3224A	Loxahatchee	2.8E+07	3/22/99	25	2	7	31.65	5	3.48	15.82	Hyalella azteca	21	Good

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NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3224A	Loxahatchee	2.8E+07	10/7/99	30	3	12	56.45	13	28.23	12.9	Baetidae/Polypedium illinoense grp.	27	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3226D	Loxahatchee	2.8E+07	8/20/92	27	2	7	16.31	7	13.16	36.17	Caenis diminuta	27	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	8/20/92	29	5	11	35	7	13	18	Caenis	31	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	8/20/92	27	5	11	37.11	7	19.59	18.56	Caenis diminuta	31	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	2/16/93	37	4	11	51.52	15	42.84	18.6	Plisidium	33	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	8/11/93	46	6	14	9.62	17	5.79	47.31	Pyrgophorus platyrachis	27	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	9/20/95	29	4	18	33.96	10	10.85	19.81	Hyalella azteca	31	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	2/20/96	33	5	14	49.46	15	26.77	25	Hydrobiidae	33	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	8/6/96	28	3	13	46.03	12	22.62	25.4	Pyrgophorus platyrachis	27	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	2/21/97	39	2	15	28.79	11	10.61	22.73	Pyrgophorus platyrachis	29	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	8/8/97	36	5	13	45.63	18	20.39	11.65	Polypedium illinoense grp.	29	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	2/21/98	44	6	22	36.84	20	21.49	36.84	Pyrgophorus platyrachis	31	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	9/21/98	27	7	6	21	7	5	26	Pyrgophorus platyrachis	27	Excellent
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	3/22/99	21	3	7	23.42	10	19.82	44.14	Pyrgophorus platyrachis	25	Good
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	10/7/99	18	2	8	26.6	9	6.91	51.06	Pyrgophorus platyrachis	25	Good
NW FORK OF LOXAHATCHEE RIVER BIO REF STATION	3230	Loxahatchee	2.8E+07	7/7/00	18	2	5	8.42	6	8.42	56.84	Pyrgophorus platyrachis	21	Good

Savanna Preserve Stormwater Impact Monitor Site	3194C	North St. Lucie	2.8E+07	10/26/95	32	1	13	48	1	6.5	16	Dero botrytis	21	Good
Savanna Preserve Stormwater Impact Monitor Site	3194C	North St. Lucie	2.8E+07	1/11/96	34	2	11	42.35	2	3.53	15.29	Dero nivea	23	Good
Savanna Preserve Stormwater Impact Monitor Site	3194C	North St. Lucie	2.8E+07	4/2/96	43	2	13	41.96	3	4.12	12.16	Micromenetus dilatatus	21	Good
Savanna Preserve Stormwater Impact Monitor Site	3194C	North St. Lucie	2.8E+07	7/16/96	33	1	12	42.86	4	0.34	23.81	Dero furcata	21	Good
Savanna Reserve @ EPSL stormwater slouth mouth	3194C	North St. Lucie	2.8E+07	1/19/96	28	4	16	53.85	8	12.82	23.08	Hyaella azteca	27	Excellent
Savanna Reserve @ EPSL stormwater slouth mouth	3194C	North St. Lucie	2.8E+07	4/18/96	32	4	11	28.07	5	6.14	30.7	Hyaella azteca	25	Good
Savanna Reserve @ EPSL stormwater slouth mouth	3194C	North St. Lucie	2.8E+07	7/17/96	23	2	9	64.29	7	7.14	21.43	Pseudochironomus	25	Good
Savanna Reserve @ GDC Illegal Causeway	3194C	North St. Lucie	2.8E+07	10/20/95	31	3	9	20.81	7	2.35	24.83	Hyaella azteca	27	Excellent
Savanna Reserve @ GDC Illegal Causeway	3194C	North St. Lucie	2.8E+07	1/10/96	23	4	12	22.29	7	6	60	Hyaella azteca	23	Good
Savanna Reserve @ GDC Illegal Causeway	3194C	North St. Lucie	2.8E+07	4/12/96	28	3	14	22.67	10	0.58	56.98	Hyaella azteca	25	Good
Savanna Reserve @ mouth of Hogpen Slough	3194C	North St. Lucie	2.8E+07	10/19/95	32	2	13	39.04	4	3.77	25.34	Dero nivea	23	Good
Savanna Reserve @ mouth of Hogpen Slough	3194C	North St. Lucie	2.8E+07	1/31/96	41	5	19	43.66	7	5.04	10.07	Ancylidae/Hyaella azteca	27	Excellent
Savanna Reserve @ mouth of Hogpen Slough	3194C	North St. Lucie	2.8E+07	4/11/96	29	4	10	35.05	4	0.52	18.56	Hyaella azteca	27	Excellent
Savanna Reserve @ mouth of Hogpen Slough	3194C	North St. Lucie	2.8E+07	7/24/96	36	2	16	54.95	6	3.6	10.81	Coenagrionidae	23	Good
Savanna Reserve @ southwest end of marsh	3194B	North St. Lucie	2.8E+07	10/23/95	25	5	13	44.09	4	2.76	25.2	Oxyethira	23	Good
Savanna Reserve @ southwest end of marsh	3194B	North St. Lucie	2.8E+07	4/19/96	28	4	14	43.18	8	3.79	24.24	Hyaella azteca	27	Excellent
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	10/19/95	27	2	6	7.35	7	0.37	25	Oxyethira	25	Good
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	1/31/96	32	3	14	33.5	9	9.47	44.17	Hyaella azteca	25	Good
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	4/11/96	19	4	8	40.71	6	11.06	32.74	Hyaella azteca	23	Good

Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	7/24/96	23	5	9	31.68	6	3.96	48.51	Hyaella azteca	23	Good
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	6/13/97	32	4	17	51.39	4	5.9	11.81	Parakiefferiella	25	Good
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	10/21/97	28	4	13	39	9	6	36	Hyaella azteca	25	Good
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	2/10/98	35	4	16	47.16	8	15.91	24.43	Hyaella azteca	31	Excellent
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	5/7/98	32	5	16	52.31	12	11.54	25.64	Hyaella azteca	29	Excellent
Savanna Reserve approx 2000 yds S of Hogpen Sl	3194C	North St. Lucie	2.8E+07	8/12/98	31	2	14	39.16	9	5.59	23.08	Dero digitata	25	Good
Savanna Reserve at Bartow St canal in marsh	3194C	North St. Lucie	2.8E+07	10/16/95	35	0	13	41.11	3	3.06	12.22	Larsia berneri	19	Poor
Savanna Reserve at Bartow St canal in marsh	3194C	North St. Lucie	2.8E+07	1/19/96	38	3	16	63.43	9	4.63	9.72	Dasyhelea	23	Good
Savanna Reserve at Bartow St canal in marsh	3194C	North St. Lucie	2.8E+07	4/4/96	37	2	15	46.19	5	1.02	27.92	Hyaella azteca	23	Good
Savanna Reserve at Bartow St canal in marsh	3194C	North St. Lucie	2.8E+07	7/15/96	33	1	10	38.61	2	0.5	15.84	Dero furcata	19	Poor
Savanna Reserve at mouth of Savanna disch ditch	3194C	North St. Lucie	2.8E+07	10/20/95	31	4	9	33.61	8	0.84	18.49	Hyaella azteca	29	Excellent
Savanna Reserve at mouth of Savanna disch ditch	3194C	North St. Lucie	2.8E+07	4/12/96	32	2	17	38.74	7	6.76	37.84	Hyaella azteca	25	Good
Savanna Reserve at mouth of Savanna disch ditch	3194C	North St. Lucie	2.8E+07	7/18/96	42	4	15	31.15	6	4.1	27.87	Hyaella azteca	27	Excellent
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	10/16/95	32	2	8	34.35	5	5.73	19.08	Dero nivea	25	Good
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	1/19/96	40	4	13	71.79	8	11.61	18.57	Dicrotendipes leucoscelis	27	Excellent
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	4/4/96	32	5	10	19.65	8	4.62	34.68	Hyaella azteca	27	Excellent
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	7/15/96	40	4	14	42.42	7	5.56	19.19	Hyaella azteca	27	Excellent
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	6/13/97	35	4	12	38.64	7	4.26	14.77	Pseudochironomus	27	Excellent
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	10/20/97	29	3	11	60.19	4	4.37	10.68	Larsia berneri	23	Good

Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	2/9/98	38	4	17	68	9	15.33	19.11	Tanytarsus sp. c epler	29	Excellent
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	5/5/98	43	4	18	40.05	8	4.44	29.74	Hyaella azteca	25	Good
Savanna Reserve near Bartow St canal	3194C	North St. Lucie	2.8E+07	8/11/98	35	3	13	59.87	4	4.78	15.29	Pseudochironomus	23	Good
Savanna Reserve near EPSL discharge	3194C	North St. Lucie	2.8E+07	10/20/95	35	2	15	47.46	7	1.98	18.08	Parachironomus alatus	25	Good
Savanna Reserve near EPSL discharge	3194C	North St. Lucie	2.8E+07	1/11/96	40	5	13	33.48	7	8.82	12.67	Tanytarsus sp. c epler	29	Excellent
Savanna Reserve near EPSL discharge	3194C	North St. Lucie	2.8E+07	4/18/96	39	2	12	32.86	5	8.93	11.43	Oxyethira/Bratislava unidentata	27	Excellent
Savanna Reserve near EPSL discharge	3194C	North St. Lucie	2.8E+07	7/17/96	38	2	12	55.06	2	5.06	19.66	Pseudochironomus	21	Good
Savanna Reserve near Howard St disch canal mouth	3194C	North St. Lucie	2.8E+07	10/26/95	40	1	14	23.72	3	5.84	44.16	Trichocorixa sexcincta	19	Poor
Savanna Reserve near Howard St disch canal mouth	3194C	North St. Lucie	2.8E+07	1/11/96	33	3	12	63.36	3	5.86	15.62	Dero nivea	21	Good
Savanna Reserve near Howard St disch canal mouth	3194C	North St. Lucie	2.8E+07	4/2/96	35	3	11	36.7	5	2.29	22.48	Hyaella azteca	25	Good
Savanna Reserve near Howard St disch canal mouth	3194C	North St. Lucie	2.8E+07	7/16/96	33	4	13	50.49	6	1.46	9.71	Polypedilum sp. a epler	25	Good
Savanna Reserve north of Illegal Causeway	3194C	North St. Lucie	2.8E+07	10/20/95	27	3	8	15.97	3	0.42	32.77	Hyaella azteca	21	Good
Savanna Reserve north of Illegal Causeway	3194C	North St. Lucie	2.8E+07	1/10/96	27	4	11	28.89	8	9.78	44.44	Hyaella azteca	27	Excellent
Savanna Reserve north of Illegal Causeway	3194C	North St. Lucie	2.8E+07	4/12/96	28	4	14	23.81	11	5.24	51.43	Hyaella azteca	27	Excellent
Savanna Reserve north of Illegal Causeway	3194C	North St. Lucie	2.8E+07	7/18/96	30	4	13	28.69	9	3.28	38.52	Hyaella azteca	27	Excellent
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	1/19/96	38	6	15	41.71	10	9.55	28.64	Hyaella azteca	31	Excellent
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	4/18/96	22	4	10	39.84	6	12.89	39.06	Hyaella azteca	23	Good
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	7/17/96	24	5	8	47.97	5	6.91	28.46	Hyaella azteca	25	Good
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	6/10/97	44	3	20	47.08	9	10.39	14.94	Dero digitata	27	Excellent

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Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	10/20/97	36	3	19	54.97	9	5.56	15.79	Parachironomus alatus	25	Good
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	2/9/98	43	5	17	44.55	6	4.5	18.96	Hyaella azteca	27	Excellent
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	5/5/98	34	3	16	62.07	6	9.48	12.07	Pseudochironomus	25	Good
Savanna Reserve off east Port St. Lucie	3194C	North St. Lucie	2.8E+07	8/12/98	35	2	15	40.77	7	4.62	26.92	Dero furcata	25	Good
Savanna Reserve S of Scott St in IR Estates	3194C	North St. Lucie	2.8E+07	10/13/95	42	1	12	23.74	2	2.52	11.51	Laevapex peninsulae	21	Good
Savanna Reserve S of Scott St in IR Estates	3194C	North St. Lucie	2.8E+07	1/4/96	38	4	12	43.2	4	5.92	15.98	Hyaella azteca	25	Good
Savanna Reserve S of Scott St in IR Estates	3194C	North St. Lucie	2.8E+07	7/15/96	36	4	13	32.71	6	2.34	14.95	Hyaella azteca	27	Excellent
Savanna Reserve South of Hogpen Slough mouth	3194C	North St. Lucie	2.8E+07	10/19/95	31	3	10	16.93	6	3.44	41.8	Hyaella azteca	23	Good
Savanna Reserve South of Hogpen Slough mouth	3194C	North St. Lucie	2.8E+07	1/31/96	25	4	7	10.65	7	1.16	75.93	Hyaella azteca	19	Poor
Savanna Reserve South of Hogpen Slough mouth	3194C	North St. Lucie	2.8E+07	4/1/96	31	5	12	22.73	9	3.25	53.25	Hyaella azteca	27	Excellent
Savanna Reserve South of Hogpen Slough mouth	3194C	North St. Lucie	2.8E+07	7/24/96	21	2	11	35.77	7	2.85	46.34	Hyaella azteca	23	Good
Savanna Reserve south of Walton Road	3194C	North St. Lucie	2.8E+07	10/20/95	36	5	13	44.76	10	8.1	16.67	Parachironomus alatus	29	Excellent
Savanna Reserve south of Walton Road	3194C	North St. Lucie	2.8E+07	1/1/96	26	3	13	52.69	8	12.87	19.76	Hyaella azteca	23	Good
Savanna Reserve south of Walton Road	3194C	North St. Lucie	2.8E+07	7/17/96	28	5	12	62.59	10	9.35	15.83	Pseudochironomus	29	Excellent
Savanna Reserve west of Lake Eden	3194C	North St. Lucie	2.8E+07	10/27/95	37	6	9	32.79	8	3.28	12.3	Hyaella azteca	29	Excellent
Savanna Reserve west of Lake Eden	3194C	North St. Lucie	2.8E+07	1/29/96	42	5	15	28.31	8	2.02	28.68	Hyaella azteca	27	Excellent
Savanna Reserve west of Lake Eden	3194C	North St. Lucie	2.8E+07	4/19/96	29	4	15	47.47	7	8.59	31.31	Hyaella azteca	27	Excellent
Savanna Reserve west of Lake Eden	3194C	North St. Lucie	2.8E+07	7/25/96	37	3	13	57.64	9	3.47	18.75	Parachironomus alatus	25	Good
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	10/13/95	29	1	13	11.38	2	1.03	28.28	Dero nivea	21	Good

Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	1/4/96	37	3	14	30.57	3	3.71	33.62	Hyaella azteca	21	Good
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	4/4/96	33	5	13	42.47	7	9.36	21.46	Hyaella azteca	29	Excellent
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	7/15/96	29	4	12	21.26	9	5.51	44.09	Hyaella azteca	27	Excellent
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	6/13/97	38	4	12	35.14	7	5.41	21.62	Dero nivea	29	Excellent
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	10/20/97	56	3	18	61.66	5	9.59	15.89	Tanytarsus sp. c epler	25	Good
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	2/9/98	25	3	9	56.12	3	15.31	27.55	Cladotanytarsus	23	Good
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	5/5/98	44	6	17	51.98	11	12.15	16.38	Hyaella azteca	29	Excellent
Savanna State Reserve @ Scott St disch canal	3194C	North St. Lucie	2.8E+07	8/11/98	27	0	8	39.62	3	6.6	25.47	Bratislavia unidentata	21	Good
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	10/19/95	23	3	10	21.71	4	2.63	28.29	Hyaella azteca	23	Good
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	1/31/96	35	5	14	30.88	8	12.01	29.41	Hyaella azteca	29	Excellent
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	4/11/96	27	3	9	22.5	8	3.13	51.25	Hyaella azteca	25	Good
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	6/13/97	36	5	13	70.63	7	18.65	26.19	Dicrotendipes	29	Excellent
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	10/21/97	30	4	14	39.53	8	9.69	21.71	Hyaella azteca	29	Excellent
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	2/10/98	32	5	12	19.38	8	5.63	31.25	Caenis diminuta	25	Good
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	5/7/98	33	2	14	24.68	11	2.85	35.44	Hyaella azteca	25	Good
SAVANNAHS AT ANKONA	3194C	North St. Lucie	2.8E+07	8/12/98	33	2	12	51.28	5	3.85	25.64	Dasyhelea	23	Good
SAVANNAHS AT WHITE CITY	3194C	North St. Lucie	2.8E+07	10/13/95	37	2	13	24.17	5	2.5	24.17	Dero nivea	25	Good
SAVANNAHS AT WHITE CITY	3194C	North St. Lucie	2.8E+07	1/12/96	30	3	13	61	6	18.5	17	Tanytarsus sp. c epler	27	Excellent
SAVANNAHS AT WHITE CITY	3194C	North St. Lucie	2.8E+07	4/2/96	30	3	15	44.68	7	8.51	19.86	Oxyethira	27	Excellent
SAVANNAHS AT WHITE CITY	3194C	North St. Lucie	2.8E+07	7/16/96	34	4	12	40.83	7	3.33	23.33	Caenis diminuta	27	Excellent
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	8/26/92	63	4	18	21.87	13	5.35	35.08	Caenis diminuta	27	Excellent
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	2/25/93	28	1	9	8.25	8	7.73	24.74	Hyaella azteca	25	Good
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	8/17/93	38	3	11	18.35	5	12.66	19.3	Caenis diminuta	27	Excellent

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SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	2/23/94	47	5	21	22	13	8.96	27.66	Hyalella azteca	31	Excellent
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	9/21/95	35	2	14	25.81	7	1.61	25.27	Cassidinidea ovalis	27	Excellent
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	2/21/96	26	2	6	24.47	7	25	15.96	Pisidiidae	25	Good
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	8/7/96	35	1	17	13.82	7	19.31	31.71	Pyrgophorus platyrachis	25	Good
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	2/26/97	26	2	10	15.72	6	31.45	29.56	Pisidiidae	27	Excellent
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	8/6/97	35	3	13	43.68	5	12.93	20.69	Hyalella azteca	25	Good
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	2/21/98	53	5	24	30.55	16	40.73	28.73	Pisidiidae	33	Excellent
SOUTH FORK ST LUCIE RIV UPSTREAM	3210B	South St. Lucie	2.8E+07	8/31/98	34	4	10	13.35	5	25.26	35.34	Pyrgophorus platyrachis	27	Excellent
SOUTH FORK ST. LUCIE RIVER	3210	South St. Lucie	2.8E+07	8/26/92	61	4	17	22.73	13	6.02	35	Caenis diminuta	27	Excellent
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	2/23/94	50	5	22	16.97	22	40.54	30.44	Pisidiidae	33	Excellent
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	9/21/95	42	3	14	38.07	6	13.94	18.77	Goeldichironomus fluctuans	25	Good
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	2/21/96	39	3	16	26.88	7	36.41	21.25	Pisidiidae	29	Excellent
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	8/7/96	37	3	23	49.13	17	15.87	16.09	Pyrgophorus platyrachis	27	Excellent
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	2/26/97	27	4	10	15.66	9	12.35	24.1	Exosphaeroma	29	Excellent
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	8/20/97	38	4	19	31.78	16	20.33	21.96	Pyrgophorus platyrachis	31	Excellent
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	2/21/98	19	3	4	5.83	2	11.65	33.01	Gammarus	17	Poor
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	8/31/98	39	3	16	20.25	13	15.95	19.02	Pyrgophorus platyrachis	29	Excellent
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	3/24/99	28	3	10	6.36	9	15.91	34.09	Gammarus	27	Excellent
South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	11/3/99	51	4	20	32.13	15	29.62	17.27	Eupera cubensis	33	Excellent

South South Fork St. Lucie River, NW Hobe Sound	3210B	South St. Lucie	2.8E+07	6/20/00	26	0	9	19.85	6	21.76	26.72	Pyrgophorus platyrachis	25	Good
TEN MI CREEK, test for Indian River Foods FYI	3194A	North St. Lucie	2.8E+07	1/12/93	31	1	10	33.14	3	2.62	11.63	Tubifex tubifex/Limnodrilus hoffmeisteri	21	Good
TEN MILE CREEK, ref for Indian River Foods FYI	3194A	North St. Lucie	2.8E+07	1/12/93	27	0	8	42.4	4	4.8	17.6	Polypedilum illinoense	19	Poor
Unnamed canal, ref for TriGas FYI	3234	Loxahatchee	2.8E+07	8/23/93	42	2	17	72.24	6	3.51	21.4	Pseudochironomus	23	Good
Unnamed canal, test for TriGas FYI	3234	Loxahatchee	2.8E+07	8/23/93	35	1	13	70.85	3	4.38	32.35	Larsia decolorata	17	Poor

^a Total number of invertebrate taxa in the orders Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies). Otherwise known as the EPT Index.

^b Florida Index score. Methods per Ross, L. T. 1990. Methods for Aquatic Biology. Florida Department of Environmental Regulation. Technical Series 10(1):1-47, Tallahassee, Florida.

^c Stream Condition Index score and evaluation, per method shown for peninsular Florida in Table 2. and Barbour, M. T., J. Gerritsen, and J.S. White. 1996. Development of the Stream Condition Index (SCI) for Florida. Prepared for the Florida Dept. of Environmental Protection. Tetra Tech, Inc., Owings Mills, Maryland

***Appendix D: Permitted Discharge Facilities, Superfund Sites, and Landfills
in the St. Lucie and Loxahatchee Basin Group, by Planning Unit***

Table D-1. Permitted Wastewater Treatment Facilities in the St. Lucie and Loxahatchee Basins

NAME	CITY	FACILITY TYPE	STATUS	NPDES	DESIGN CAP(mgd)	PLANNING UNIT
HOBE SOUND MOBILE HOME PARK	HOBE SOUND	DW	A	N	0.0150	South St. Lucie
SOUTH FORK HOMEOWNER'S UTILITY CORP	STUART	DW	A	N	0.0150	South St. Lucie
LAKESIDE VILLAGE MHP	HOBE SOUND	DW	A	N	0.0150	South St. Lucie
INDIANTOWN COMPANY INC	INDIANTOWN	DW	A	Y	1.0000	C-44
RIVERWATCH (FKA BEAU JARDIN APTS)	JENSEN BEACH	DW	A	N	0.0100	Coastal
FISHERMAN'S HAVEN, WWTF	JENSEN BEACH	DW	A	N	0.0250	Coastal
SOUTH MARTIN REGIONAL UTILITIES WWTF FKA HYDRATECH	HOBE SOUND	DW	A	N	1.2000	Coastal
SEA BREEZE MOBILE MANOR	HOBE SOUND	DW	A	N	0.0150	Coastal
ST LUCIE MOBILE VILLAGE	INDIANTOWN	DW	A	N	0.0400	C-44
LEILANI HEIGHTS UTL CORP	JENSEN BEACH	DW	A	N	0.1500	Coastal
BLUE HERON TRAVEL TR PK	JENSEN BEACH	DW	A	N	0.0080	Coastal
SOUNDINGS YACHT & TENNIS CLUB INC	HOBE SOUND	DW	A	N	0.0550	Coastal
HALF MILE LAKE CONDO	STUART	DW	A	N	0.0083	North St. Lucie
VILLAGE OF 800 PLACE	STUART	DW	A	N	0.0210	North St. Lucie
PINELAKE VILLAGE	JENSEN BEACH	DW	A	N	0.0990	Coastal
NATALIE ESTATES MHP	STUART	DW	A	N	0.0240	Coastal
BEACON 21 CONDO APTS	JENSEN BEACH	DW	A	N	0.0990	Coastal
FAIRWINDS GOLF COURSE WWTF, SLCU ST LUCIE COUNTY	FORT PIERCE	DW	A	N	0.0223	C-25
SLCU SOUTH HUTCHINSON ISLAND REG. WWTF	ST. LUCIE COUNTY	DW	A	Y	1.6000	Coastal
FORT PIERCE UTILITIES KING ELECTRIC	FT PIERCE	IW	A	Y	0.0000	Coastal
FORT PIERCE UTILITY AUTHORITY—WWTF	FT PIERCE	DW	A	Y	9.0000	Coastal
VILLAGE SQUARE SHOPPING CENTER	PORT ST. LUCIE	DW	A	N	0.0200	North St. Lucie
SAVANNA CLUB	PORT ST. LUCIE	DW	A	N	0.1500	North St. Lucie
SPANISH LAKES-RIVERFRONT	PORT ST LUCIE	DW	A	N	0.1000	North St. Lucie
INDIAN RIVER LANDING	ST LUCIE CO	DW	A	N	0.0250	North St. Lucie

Table D-1 (continued)

NAME	CITY	FACILITY TYPE	STATUS	NPDES	DESIGN CAP (mgd)	PLANNING UNIT
SPANISH LAKES COUNTRY CLUB	FT. PIERCE	DW	A	N	0.1600	C-25
NORTH COUNTY (HOLIDAY PINES)	FT. PIERCE	DW	A	N	0.2100	C-25
ISLAND DUNES	HUTCHINSON ISLAND	DW	A	N	0.0880	Coastal
VISTA ST. LUCIE	FT. PIERCE	DW	A	N	0.0800	North St. Lucie
GROVE, THE	FT. PIERCE	DW	A	N	0.1600	North St. Lucie
ST LUCIE PLAZA	PORT ST LUCIE	DW	A	N	0.0100	North St. Lucie
TROPICAL ISLE P.U.D.	FT. PIERCE	DW	A	N	0.0500	North St. Lucie
HARBOR BRANCH OCEANOGRAPHIC/FT. PIERCE	FORT PIERCE	IW	A	Y	0.0045	Coastal
ST LUCIE WEST UTILITIES, INC.	ST. LUCIE WEST	DW	A	N	1.0000	C-24
GOLDEN HARVEST PACKING COMPANY	FORT PIERCE	IW	A	N	0.0080	Coastal
PACKERS OF INDIAN RIVER (FKA CHIQUITA CITRUS PACKERS)	FORT PIERCE	IW	A	N	0.0300	North St. Lucie
SPANISH LAKES FAIRWAYS PH 1-4	FT. PIERCE	DW	A	N	0.2500	C-25
OCEAN TOWERS R/O BRINE REJECT	JENSEN BEACH	IW	A	N	0.0300	Coastal
SPANISH LAKE FAIRWAYS R.O. CONCENTRATE	FORT PIERCE	IW	A	Y	0.7800	C-25
SEA AG, INC.	FORT PIERCE	IW	N	N	0.0000	Coastal
H & S CITRUS, INC.	FORT PIERCE	IW	A	N	0.0150	North St. Lucie
RIVER PARK MARINA WWTF	FT. PIERCE	DW	A	N	0.0150	Coastal
PORT ST LUCIE UTIL NORTHPORT / DIW	PORT. ST. LUCIE	DW	A	N	2.0000	North St. Lucie
LAKE MANOR	JENSEN BEACH	DW	A	N	0.0100	Coastal
PORT ST LUCIE MEDICAL WWTF	PORT ST LUCIE	DW	A	N	0.0075	North St. Lucie
COUNTRY COVE MHP	FT PIERCE	DW	A	N	0.0300	C-25
TROPICANA PRODUCTS (IW)	FORT PIERCE	IW	A	N	0.5500	North St. Lucie
HARBOR BRANCH FOUNDATION WWTF	FT PIERCE	DW	A	N	0.0150	Coastal
SLCU LAKEWOOD PARK WWTF	FT PIERCE	DW	A	N	0.0400	C-25
FPL ST LUCIE NUCLEAR	FT PIERCE	IW	A	Y	771.6000	Coastal
FLORIDA ROCK INDUSTRIES/FORT PIERCE	PORT ST. LUCIE	IW	A	Y	26.6500	C-24
TRI-GAS, INC., INDUSTRIAL GASES	JUPITER	IW	A	N	0.0250	Loxahatchee
PIPER'S LANDING PROPERTY OWNERS ASSOCIATION	PALM CITY	IW	A	Y	0.0019	South St. Lucie
ST. LUCIE COUNTY SANITARY LANDFILL	FORT PIERCE	IW	A	Y	0.0000	North St. Lucie

Table D-1 (continued)

NAME	CITY	FACILITY TYPE	STATUS	NPDES	DESIGN CAP (mgd)	PLANNING UNIT
PRATT & WHITNEY (INDUSTRIAL WASTE)	WEST PALM BEACH	IW	A	Y	0.0000	Loxahatchee
BELLSOUTH CAR WASH FACILITY (GP)	FT. PIERCE	IW	A	N	0.0006	North St. Lucie
JONATHAN DICKINSON MTA COOLING TOWER BLOWDOWN DISPOSAL	TEQUESTA	IW	A	N	0.0100	Loxahatchee
VILLAGE OF TEQUESTA RO CONCENTRATE DISPOSAL	TEQUESTA	IW	A	Y	1.3000	Loxahatchee
NICHOLS SANITATION TRUCK WASH (CLRS)	HOBE SOUND	IW	A	N	0.0100	Loxahatchee
MARTIN DOWNS COUNTRY CLUB (CLRS)	PALM CITY	IW	A	N	0.0460	South St. Lucie
HARBOR BRANCH OCEANOGRAPHIC INSTITUTION POST DOC APARTMENTS	FORT PIERCE	DW	A	N	0.0150	Coastal
JUPITER FARMS COMM. SHOPPING CENTER	NORTH PALM BEACH	DW	A	N	0.0364	Loxahatchee
ALLIED UNIVERSAL CORP., FT PIERCE PLANT	FORT PIERCE	IW	A	N	0.0050	C-24
AMERICAN CUSTOM YACHTS, INC.	STUART	IW	A	N	0.0010	South St. Lucie
DO IT FARMS CLAM NUERSERY (GP)	FORT PIERCE	IW	A	N	0.0000	Coastal
PRINCESS CONDOMINIUM R.O. CONCENTRATE	JENSEN BEACH	IW	A	Y	0.0630	Coastal
MARTIN COUNTY UTILITIES NORTH WWTF	JENSEN BEACH	DW	A	N	1.2000	North St. Lucie
SUNBRITE CITRUS, INC.	FORT PIERCE	IW	A	N	0.0180	North St. Lucie
FPL MARTIN 3 AND 4	INDIANTOWN	DW	A	N	0.0050	C-44
SUNLIGHT CITRUS PACKING, INC.	FT. PIERCE	IW	A	N	0.0068	North St. Lucie
MARTIN CORRECTIONAL INSTITUTE	INDIANTOWN	DW	A	N	0.6000	C-23
PRATT & WHITNEY PLANT #1 PLANT	W PALM BEACH ,20 MI W	DW	A	N	0.2190	Loxahatchee
BLOOMFIELD MEADOWS VACATION PARK(FORMERLY HOBE SOUND VAC PK)	HOBE SOUND	DW	A	N	0.0050	South St. Lucie
ANGLE INN MOTOR COURT	HOBE SOUND	DW	A	N	0.0090	Coastal
MARTIN COUNTY UTIL, TROPICAL FARMS	STUART	DW	A	N	0.9400	South St. Lucie
LOXAHATCHEE ENV. CONTROL DIST. WWTP	JUPITER	DW	A	Y	9.0000	Loxahatchee
GATEWAY COVE TOWNHOMES	STUART	DW	A	N	0.0025	Coastal
SEACOAST UTILITIES PGA WWTP	PALM BEACH GRDNS	DW	A	Y	12.0000	Loxahatchee
JUPITER WATER TREATMENT PLANT	JUPITER	IW	A	Y	2.0000	Loxahatchee
INDIANTOWN GENERATING PLANT	INDIANTOWN	IW	A	Y	0.0500	C-44

Table D-1 (continued)

NAME	CITY	FACILITY TYPE	STATUS	NPDES	DESIGN CAP (mgd)	PLANNING UNIT
MARTIN COUNTY REST AREA I-95	STUART	DW	A	N	0.0160	South St. Lucie
PRATT & WHITNEY DILUTE ACID/ALK RINSE	JUPITER	IW	N	N	1.1000	Loxahatchee
PRATT & WHITNEY (AREA C)	JUPITER	IW	N	N	0.0000	Loxahatchee
CUSHMAN FRUIT CO. (FORMER SUN CITRUS)	FORT PIERCE	IW	A	N	0.0030	C-25
FLORIDA GAS TRANSMISSION COMPANY COMPRESSOR STATION NO. 20	FORT PIERCE	IW	A	N	0.0006	North St. Lucie
IFAS/FT. PIERCE RESEARCH CENTER	FT. PIERCE	IW	A	N	0.0010	North St. Lucie
FRESHCO, LTD. CITRUS PROCESSING PLANT	FORT PIERCE	IW	A	N	0.0100	North St. Lucie
BURNAC PRODUCE, INC	PORT ST LUCIE	IW	A	N	0.0000	C-24
SAILFISH POINT UTILITY CORP.	STUART	IW	A	Y	0.1150	Coastal
ISLAND GOLF CLUB R.O. CONCENTRATE DISPOSAL	HOBE SOUND	IW	A	N	0.0667	Coastal
PRATT & WHITNEY (E8B AREA)	WEST PALM BEACH	IW	N	N	0.0000	Loxahatchee
SAILFISH POINT WWTF	STUART	DW	A	N	0.2510	Coastal
MARTIN COUNTY UTIL, MARTIN DOWNS WWTF	PALM CITY	DW	A	N	2.0000	South St. Lucie
OCEAN BREEZE PARK, (TOWN OF)	JENSEN BEACH	DW	A	N	0.0240	Coastal
JUPITOR FARMS ELEM. SCHOOL	JUPITER	DW	A	N	0.0300	Loxahatchee
TROPICAL ACRES MHP WWTF	JENSEN BEACH	DW	A	N	0.0250	Coastal
RIVER VISTA APARTMENTS WWTF	JENSEN BEACH	DW	A	N	0.0050	Coastal
TERRACE GARDENS	STUART	DW	A	N	0.0110	North St. Lucie
HOBE VILLAGE MOBILE HOME PARK	HOBE SOUND	DW	A	N	0.0200	Coastal
ORCHID ACRES MHP WWTF	FT PIERCE	DW	A	N	0.0050	C-25
UNITED TECHNOLOGIES CORP.	WEST PALM BEACH	UIC	A	N	0.0000	Loxahatchee
EVERGLADES YOUTH CAMP	W PALM BEACH	DW	A	N	0.0125	Loxahatchee
MARTIN COUNTY UTILITIES DEPT.	STUART	OTH	A	N	0.0000	North St. Lucie
FLA, EVANGELISTIC ASSN.	HOBE SOUND	DW	A	N	0.0360	Coastal
SLCU NORTH HUTCHINSON ISLAND WWTF	FT. PIERCE	DW	A	N	0.0000	Coastal
PORT ST LUCIE LANES INC -	FORT PIERCE	DW	A	N	0.0050	North St. Lucie

Table D-1 (continued)

NAME	CITY	FACILITY TYPE	STATUS	NPDES	DESIGN CAP (mgd)	PLANNING UNIT
RIVIERA APARTMENTS WWTF	FORT PIERCE	DW	A	N	0.0050	Coastal
TREASURE COVE DUNES	FT. PIERCE	DW	A	N	0.0100	Coastal
OCEAN HARBOR CONDOS SOUTH	FT. PIERCE	DW	A	N	0.0600	Coastal
RAY MELEAR, INC	OKEECHOBEE	AFO	A	N	0.0000	C-23
LARSON DAIRY-BARN #4 (SJR BASIN)	OKEECHOBEE	IW	X	Y	0.0000	C-25
TURNPIKE DAIRY, INC. (SJR BASIN)	INDIANTOWN	IW	X	Y	0.0000	C-23
TRIPLE G DAIRY	SEBRING	IW	C	N	0.0000	C-25
EKE GATLIN MOBIL CAR WASH (GP)	PORT ST LUCIE	IW	A	N	0.0000	C-24
PBC SCHOOL "D" R.O. CONC. (AKA JUPITER FARMS ELEM. SCHOOL)	JUPITER	IW	A	N	0.0000	Loxahatchee
N COUNTY GENERAL AVIATION AIRPORT	PALM BEACH GARDENS	DW	A	N	0.0120	Loxahatchee
PALM BEACH PARK OF COMM. STP.	WEST PALM BEACH	DW	A	N	0.0600	Loxahatchee
WEST JUPITER CAMPGROUND	JUPITER	DW	A	N	0.0150	Loxahatchee
PRATT & WHITNEY C12/C14 COOLING T.	WEST PALM BEACH	IW	N	N	0.0000	Loxahatchee
PRATT & WHITNEY (AREAS A,C,C11,C12/14,D E)	WEST PALM BEACH	IW	N	N	0.0000	Loxahatchee
SOUTH FORK HIGH SCHOOL/MARTIN CNTY	STUART	DW	A	N	0.0300	South St. Lucie
STUART, CITY OF	STUART	DW	A	N	4.0000	South St. Lucie
FPL MARTIN CO PLANT	INDIANTOWN	IW	A	Y	0.0000	C-44
CUTTER SOUND	PALM CITY	DW	A	N	0.0986	North St. Lucie
CONQUISTADOR CONDO APTS	STUART	DW	A	N	0.0800	Coastal
FPL MARTIN 1 & 2	INDIANTOWN	DW	A	N	0.0160	C-44
INDIAN RIVER PLANTATION	STUART	DW	A	N	0.3000	Coastal
GARDEN VILLAS CONDOMINIUM	STUART	DW	A	N	0.0150	North St. Lucie
BANYAN HOUSE CONDO	STUART	DW	A	N	0.0250	Coastal
FIRST FAIRWAY S/D	STUART	DW	A	N	0.0030	Coastal
MARKET PLACE OF HOBE SOUND	HOBE SOUND	DW	A	N	0.0300	Coastal
NORTH SHORE PLAZA WWTF	STUART	DW	A	N	0.0210	North St. Lucie

Table D-1 (continued)

NAME	CITY	FACILITY TYPE	STATUS	NPDES	DESIGN CAP (mgd)	PLANNING UNIT
PIPERS LANDING	PALM CITY	DW	A	N	0.1000	South St. Lucie
JENSEN BEACH PLAZA	JENSEN BEACH	DW	A	N	0.0047	North St. Lucie
OCEAN BREEZE PLAZA	JENSEN BEACH	DW	A	N	0.0036	Coastal
OLD TRAIL CLUBHOUSE WWTP	STUART	DW	A	N	0.0100	Loxahatchee
RIO INDUSTRIAL CENTER WWTF	JENSEN BEACH	DW	A	N	0.0085	Coastal
PALMS MOTEL (THE)	HOBE SOUND	DW	A	N	0.0100	Coastal
STUART YACHT CLUB & MARINA INC.	STUART	DW	A	N	0.0002	North St. Lucie
JOE'S POINT RO CONCENTRATE	STUART	IW	A	N	0.0400	Coastal
JUST LIKE HOME KENNELS	PALM CITY	IW	N	N	0.0005	South St. Lucie
KELLY KENNEL	PALM CITY	IW	N	N	0.0000	South St. Lucie
CAULKINS INDIANTOWN CITRUS	INDIANTOWN	IW	A	N	1.4000	C-44
COBBLESTONE CLUBHOUSE	STUART	DW	A	N	0.0020	C-23
WOODBIDGE MOBILE VILLAGE (WWTP)	HOBE SOUND	DW	A	N	0.0150	Coastal
DUNKLIN MEMORIAL REHAB CAMP LAUNDRY	(10 MILES N OF INDIANTOWN)	IW	A	N	0.0015	C-23
ST LUCIE SETTLEMENT INC	STUART	DW	A	N	0.0050	South St. Lucie
MILES GRANT CONDO	STUART	DW	A	N	0.3000	Coastal
TWIN RIVERS MHP	HOBE SOUND	DW	A	N	0.0075	South St. Lucie
RONNY'S MOBILE RANCH	STUART	DW	A	Y	0.0050	South St. Lucie
MEADOWOOD COUNTRY CLUB	FT. PIERCE	DW	A	N	0.1800	C-25
NORRIS' RESTAURANT (NORTH)	FORT PIERCE	DW	A	N	0.0060	Coastal
LA BUONA VITA MHP	PORT ST LUCIE	DW	A	N	0.0285	North St. Lucie
PORT ST LUCIE UTIL SOUTHPORT	PORT ST. LUCIE	DW	A	N	2.2000	North St. Lucie
PORT ST LUCIE UTIL WESTPORT	PORT ST LUCIE	DW	A	N	0.5000	North St. Lucie
HARBOUR RIDGE P.U.D.	FT PIERCE	DW	A	N	0.1200	North St. Lucie
FAITH FARMS ADVANCED SEPTIC SYSTEM	OKEECHOBEE	DW	A	N	0.0120	C-23
MCU CONSOLIDATED REUSE SYSTEM SOUTH COUNTY	PORT SALERNO	DW	A	Y	4.2700	South St. Lucie
BENTONWOOD MOBILE HOME PARK	FT PIERCE	DW	A	N	0.0080	North St. Lucie
RESERVE UTILITY CORPORATION	FT. PIERCE	DW	A	N	0.0430	North St. Lucie

Notes: D-domestic wastewater; IW-industrial wastewater; A-active; I-inactive; N-not an NPDES facility; Y-an NPDES facility that discharges to surface water

Table D-2. Landfills in the St. Lucie and Loxahatchee Basins

Planning Unit	City	Address
C-23	OKEECHOBEE	10800 NE 128TH AVENUE
C-23	PALM CITY	3.7MI W TURNPK OVERPASS SR714
C-23	PALM CITY	3.7MI W TURNPK OVERPASS SR714
C-24	PORT ST LUCIE	1144 SW SAVAGE BLVD
C-25	FT PIERCE	N OF ST LUCIE CO AIRPORT
C-25	FT PIERCE	HAMMOND RD OFF ST LUCIE BLVD
Coastal	OCEAN BREEZE	OCEAN BREEZE DR
Loxahatchee	HOBE SOUND	SR708, 3MI SE HOBE SOUND
Loxahatchee	JUPITER	W END OF ROEBUCK RD
Loxahatchee	WEST PALM BEACH	1.5MI W JCT SR710 & SR711
Loxahatchee	WEST PALM BEACH	BEE LINE HWY, STRD 710
North St. Lucie	FT PIERCE	LANDFILL RD & GLADES CUTOFF RD
North St. Lucie	FT PIERCE	LANDFILL RD & GLADES CUTOFF RD
Okeechobee Waterway (C-44)	INDIANTOWN	SR609, 4MI N INDIANTOWN
South St.Lucie - IRL	PALM CITY	3.7MI W TURNPK OVERPASS SR714
South St.Lucie - IRL	STUART	W. OF U.S.1 - S. OF MONTEREY RD
South St.Lucie - IRL	STUART	MONTEREY ROAD

Appendix E: Summary of Water Quality Monitoring Stations used in the Impaired Surface Waters Evaluation of the St. Lucie and Loxahatchee Basin Group

Table E: Water Quality Monitoring Stations Used in the Assessment

St. Lucie and Loxahatchee

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
C-23	3200	C-23	STREAM	21FLSFWMWC23S48	UPSTREAM OF WEIR S48 ON	1991	2000	2233
	3200	C-23	STREAM	21FLSFWMWC23S97	UPSTREAM OF S97 ON C-23	1991	1999	803
	3200	C-23	STREAM	21FLWPB 28010349	C23 Canal @ Boat Ramp	1999	2000	78
C-24	3197	C-24	STREAM	21FLSFWMWC24S49	UPSTREAM OF S49 ON C-24	1991	2000	2117
	3197	C-24	STREAM	21FLWPB 28010306	C24 JUST UPSTREAM	1999	1999	41
	3197	C-24	STREAM	21FLWPB 28010883	C-24 CANAL AT GLADES	1999	2000	55
C-25	3163	C-25 EAST/FT. PIERCE	STREAM	21FLA 27020535	BELCHER CANAL AT 25TH	1995	1995	47
	3163	C-25 EAST/FT. PIERCE	STREAM	21FLSFWMWC25S50	UPSTREAM OF WEIR S50 ON	1991	2000	2257
	3163	C-25 EAST/FT. PIERCE	STREAM	21FLWPB 27020572	Taylor Creek - Indian River	2000	2000	15
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATANN1	ANN IN ST LUCIE CO.-SEE	1991	2000	412
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATANN2	ANN IN ST LUCIE CO.-SEE	1991	2000	415
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATANN3	ANN IN ST LUCIE CO.-SEE	1991	2000	413
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATBEL AIR1	BEL AIR IN ST LUCIE CO.-SEE	1991	2000	57
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATBEL AIR2	BEL AIR IN ST LUCIE CO.-SEE	1991	2000	57
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATBEL AIR3	BEL AIR IN ST LUCIE CO.-SEE	1991	2000	57
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATDAVID1	DAVID IN ST LUCIE CO.-SEE	1991	2000	161
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATDAVID2	DAVID IN ST LUCIE CO.-SEE	1991	2000	159
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATDAVID3	DAVID IN ST LUCIE CO.-SEE	1991	2000	162
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATDE WITT1	DE WITT IN ST LUCIE	1991	2000	188

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATDE WITT2	DE WITT IN ST LUCIE	1991	2000	187
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATDE WITT3	DE WITT IN ST LUCIE	1991	2000	185
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATDEBORAH1	DEBORAH IN ST LUCIE	1991	2000	361
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATDEBORAH2	DEBORAH IN ST LUCIE	1991	2000	376
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATDEBORAH3	DEBORAH IN ST LUCIE	1991	2000	380
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATHARRIET1	HARRIET IN ST LUCIE	1991	1991	11
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATHARRIET2	HARRIET IN ST LUCIE	1991	1991	12
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATHARRIET3	HARRIET IN ST LUCIE	1991	1991	12
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATJEAN1	JEAN IN ST LUCIE CO.-SEE	1991	1999	290
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATJEAN2	JEAN IN ST LUCIE CO.-SEE	1991	1999	286
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATJEAN3	JEAN IN ST LUCIE CO.-SEE	1991	1999	284
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATJEFFERY LAKE1	JEFFERY IN ST LUCIE	1991	1992	41
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATJEFFERY LAKE2	JEFFERY IN ST LUCIE	1991	1992	41
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATJEFFERY LAKE3	JEFFERY IN ST LUCIE	1991	1992	41
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATKAREN1	KAREN IN ST LUCIE CO.-SEE	1991	2000	225
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATKAREN2	KAREN IN ST LUCIE CO.-SEE	1991	2000	225
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATKAREN3	KAREN IN ST LUCIE CO.-SEE	1991	2000	225
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATLAGUNA1	LAGUNA IN ST LUCIE	1991	1997	48
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATLAGUNA2	LAGUNA IN ST LUCIE	1991	1997	48
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATLAGUNA3	LAGUNA IN ST LUCIE	1991	1997	47
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATMARGARET1	MARGARET IN ST LUCIE	1991	2000	402

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATMARGARET2	MARGARET IN ST LUCIE	1991	2000	401
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATMARGARET3	MARGARET IN ST LUCIE	1991	2000	404
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATPATRICIA1	PATRICIA IN ST LUCIE	1991	1992	11
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATPHYLLIS1	PHYLLIS IN ST LUCIE	1991	1999	9
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATPHYLLIS2	PHYLLIS IN ST LUCIE	1991	1999	9
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATPHYLLIS3	PHYLLIS IN ST LUCIE	1991	1999	9
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATROSE LAKE1	ROSE IN ST LUCIE CO.-SEE	1991	2000	275
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATROSE LAKE2	ROSE IN ST LUCIE CO.-SEE	1991	2000	275
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATROSE LAKE3	ROSE IN ST LUCIE CO.-SEE	1991	2000	276
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATRUC1	RUCE IN ST LUCIE CO.-SEE	1991	1997	21
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATRUC2	RUCE IN ST LUCIE CO.-SEE	1991	1997	21
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATRUC3	RUCE IN ST LUCIE CO.-SEE	1991	1997	21
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATSHARON1	SHARON IN ST LUCIE	1991	1993	25
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATSHARON2	SHARON IN ST LUCIE	1991	1993	25
	3163A	LAKEWOOD PARK LAKES	LAKE	21FLKWATSHARON3	SHARON IN ST LUCIE	1991	1993	25
Coastal	3166	MOORE CREEK	ESTUARY	21FLSFWMIRL33	ICWW AT ENTRANCE TO	1991	1999	804
	3190	NORTH COASTAL	ESTUARY	21FLA 70020SEAS	North of North Beach Cswy.,	1991	1995	560
	3190	NORTH COASTAL	ESTUARY	21FLA 70030SEAS	Across from N. Bch. Cswy	1991	2000	3594
	3190	NORTH COASTAL	ESTUARY	21FLA 70040SEAS	Cook point southeast of	1991	2000	568
	3190	NORTH COASTAL	ESTUARY	21FLA 70050SEAS	Middle canal in Ft. Pierce Cut	1991	1995	291

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3190	NORTH COASTAL	ESTUARY	21FLA 70060SEAS	100 yards WSW of Wildcat	1991	2000	568
	3190	NORTH COASTAL	ESTUARY	21FLA 70070SEAS	ICWW channel marker 180	1991	1995	293
	3190	NORTH COASTAL	ESTUARY	21FLA 70071SEAS	N. tip of island E of ICWW CM	1991	1995	293
	3190	NORTH COASTAL	ESTUARY	21FLA 70080SEAS	ICWW channel marker 178	1991	1995	299
	3190	NORTH COASTAL	ESTUARY	21FLA 70090SEAS	Indian River/St. Lucie	1991	2000	576
	3190	NORTH COASTAL	ESTUARY	21FLA 70091SEAS	Private CM 4 west of ICWW	1991	2000	570
	3190	NORTH COASTAL	ESTUARY	21FLINDRIR370	INDIAN RIVER LAGOON-ST	1991	1998	272
	3190	NORTH COASTAL	ESTUARY	21FLSFWMIRL34	ICWW AT ENTRANCE TO	1991	2000	877
	3190	NORTH COASTAL	ESTUARY	21FLSFWMIRL35	ICWW IN FT. PIERCE CUT	1991	1999	862
	3190	NORTH COASTAL	ESTUARY	21FLSFWMIRL36	ICWW AT CHANNEL	1991	2000	558
	3190	NORTH COASTAL	ESTUARY	21FLSFWMIRL37	HALF WAY DOWN CANAL	1991	1999	862
	3190	NORTH COASTAL	ESTUARY	21FLSFWMIRL38	ICWW NORTH OF HARBOR	1991	1999	634
	3190	NORTH COASTAL	ESTUARY	21FLSFWMIRL39	ICWW WEST OF CHANNEL	1991	2000	519
	3190	NORTH COASTAL	ESTUARY	21FLSLMCWQ19ATC	INDIAN R. ADJ. TO CO.	1995	1998	210
	3190A	LITTLE JIM BRIDGE	COASTAL	21FLDOH ST LUCIE4	LITTLE JIM BRIDGE	2000	2000	5
	3193	ST. LUCIE RIVER	ESTUARY	21FLA 27020449	ST LUCIE ESTUARY NEAR W	1998	1998	23
	3193	ST. LUCIE RIVER	ESTUARY	21FLA 27020450	ST LUCIE ESTRY NEAR EAST	1998	1998	39
	3193	ST. LUCIE RIVER	ESTUARY	21FLA 27020451	ST LUCIE ESTUARY W OF	1998	1998	23
	3193	ST. LUCIE RIVER	ESTUARY	21FLA 27020453	STLUCIE NR SHORE SOUTH	1998	1998	44
	3193	ST. LUCIE RIVER	ESTUARY	21FLA 28010020	ST LUCIE RIVER AT A1A IN	1992	1992	24
	3193	ST. LUCIE RIVER	ESTUARY	21FLA 28010104	MOUTH OF WARNER CRK	1992	1992	25

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3193	ST. LUCIE RIVER	ESTUARY	21FLA 28010226	ST.LUCIE RIVER EAST OF	1992	1992	25
	3193	ST. LUCIE RIVER	ESTUARY	21FLA 28010227	ST.LUCIE RIVER EAST US1	1992	1992	25
	3193	ST. LUCIE RIVER	ESTUARY	21FLA 28010793	ST LUCIE R AT MANATEE	1992	1992	25
	3193	ST. LUCIE RIVER	ESTUARY	21FLA 28010866	ST LUCIE RIV NR SEAWALL	1992	1992	24
	3193	ST. LUCIE RIVER	ESTUARY	21FLINDRIR440	mouth of St. Lucie R Rocky Pt	1995	1998	486
	3193	ST. LUCIE RIVER	ESTUARY	21FLINDRSL000	dock on west shore of St	1994	1998	585
	3193	ST. LUCIE RIVER	ESTUARY	21FLSFWMBMD-0.5	PRIMARY PRODUCTIVITY	2000	2000	3
	3193	ST. LUCIE RIVER	ESTUARY	21FLSFWMBMD-1.5	PRIMARY PRODUCTIVITY	2000	2000	3
	3193	ST. LUCIE RIVER	ESTUARY	21FLSFWMBMD-2.5	PRIMARY PRODUCTIVITY	2000	2000	3
	3193	ST. LUCIE RIVER	ESTUARY	21FLSFWMBMS	PRIMARY PRODUCTIVITY	2000	2000	3
	3193	ST. LUCIE RIVER	ESTUARY	21FLSFWMHGS	PRIMARY PRODUCTIVITY	2000	2000	3
	3193	ST. LUCIE RIVER	ESTUARY	21FLSFWMIRL15	ST LUCIE RIVER UNDER A1A	1991	1999	873
	3193	ST. LUCIE RIVER	ESTUARY	21FLSFWMSE 01	OUTFLOW GATE NEAR THE	1991	2000	4605
	3193	ST. LUCIE RIVER	ESTUARY	21FLSFWMSE 02	CHANEL MARKER Z1 OUT	1991	2000	3702
	3193	ST. LUCIE RIVER	ESTUARY	21FLWPB 28010020	ST LUCIE RIVER AT A1A IN	2000	2000	21
	3193	ST. LUCIE RIVER	ESTUARY	21FLWPB 28010226	ST.LUCIE RIVER EAST OF	1999	2000	262
	3193	ST. LUCIE RIVER	ESTUARY	21FLWPB 28010365	St Lucie Estuary off Wahoos	2000	2000	31
	3193	ST. LUCIE RIVER	ESTUARY	21FLWPB 28010457	St Lucie Estuary @ Marker	2000	2000	22
	3193	ST. LUCIE RIVER	ESTUARY	21FLWPB 28010458	St Lucie Estuary @ Marker	2000	2000	11
	3193	ST. LUCIE RIVER	ESTUARY	21FLWPB 28010459	St Lucie Estuary@ Hellsgate	2000	2000	11
	3208	MANATEE POCKET	ESTUARY	21FLA 28010100	GREAT POCKET AT ICW	1998	1998	16

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3208	MANATEE POCKET	ESTUARY	21FLA 28010188	MANATEE POCKET AT	1998	1998	6
	3208	MANATEE POCKET	ESTUARY	21FLINDRMP01	INDIAN RIVER	1991	1995	588
	3208	MANATEE POCKET	ESTUARY	21FLINDRMP010	Manatee Pocket on Manatee	1995	1998	384
	3208	MANATEE POCKET	ESTUARY	21FLINDRW001	WILLOUGHBY CREEK	1992	1993	38
	3208	MANATEE POCKET	ESTUARY	21FLINDRW010	Boat House@Whiticar Boat 2	1995	1998	197
	3208	MANATEE POCKET	ESTUARY	21FLSFWMIRL12B	ST.LUCIE INLET STATE PARK	1999	2000	49
	3208	MANATEE POCKET	ESTUARY	21FLSFWMIRL13	MARTIN CNTY. IN ICWW AT	1991	1999	529
	3208	MANATEE POCKET	ESTUARY	21FLSFWMIRL14	MARTIN CNTY. IN ICWW	1991	1999	500
	3208	MANATEE POCKET	ESTUARY	21FLSFWMSE 11	ST. LUCIE INLET N. SIDE OF	1997	2000	390
	3208A	MARTIN CO. ICCW	ESTUARY	21FLSFWMIRL06	MARTIN CNTY. IN ICWW 50	1991	2000	873
	3208A	MARTIN CO. ICCW	ESTUARY	21FLSFWMIRL07	MARTIN COUNTY IN ICWW	1991	1999	648
	3208A	MARTIN CO. ICCW	ESTUARY	21FLSFWMIRL08	MARTIN CNTY. IN ICWW IN	1991	1999	656
	3208A	MARTIN CO. ICCW	ESTUARY	21FLSFWMIRL08B	SEAGRASS SITE 70 SOUTH	1999	2000	26
	3208A	MARTIN CO. ICCW	ESTUARY	21FLSFWMIRL09	MARTIN CNTY. IN ICWW AT	1991	1999	740
	3208A	MARTIN CO. ICCW	ESTUARY	21FLSFWMIRL10	MARTIN CNTY. IN ICWW IN	1991	1999	854
	3208A	MARTIN CO. ICCW	ESTUARY	21FLSFWMIRL11	MARTIN CNTY. IN ICWW AT	1991	1999	655
	3208A	MARTIN CO. ICCW	ESTUARY	21FLSFWMIRL11B	NORTH END EAST SIDE	1999	2000	24
	3208A	MARTIN CO. ICCW	ESTUARY	21FLSFWMIRL12	MARTIN CNTY. IN ICWW .5	1991	1999	773
	3226	JUPITER INLET	ESTUARY	21FLFLOX 10	JUPITER INLET 50YDS N	1991	1998	650
	3226	JUPITER INLET	ESTUARY	21FLFLOX 20	INTRACOASTAL	1991	1998	775
	3226	JUPITER INLET	ESTUARY	21FLFLOX 30	INTRACOASTAL	1991	1998	781

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3226	JUPITER INLET	ESTUARY	21FLLOX B21	SEAGRASS BED EAST OF	1992	1998	146
	3226	JUPITER INLET	ESTUARY	21FLPBCH5	ICW AT SR 707 BRIDGE	1991	1992	91
	3226	JUPITER INLET	ESTUARY	21FLPBCH6	INTRACOASTAL WWY AT	1991	1992	92
	3226	JUPITER INLET	ESTUARY	21FLSFWMIRL01	0.6 MILES NORTH OF	1991	1999	541
	3226B	MARTIN CO. ICW	ESTUARY	21FLLOX 25	SEAGRASS BED WEST OF	1992	1998	597
	3226B	MARTIN CO. ICW	ESTUARY	21FLLOX B25	SEAGRASS BED WEST OF	1992	1998	85
	3226B	MARTIN CO. ICW	ESTUARY	21FLSFWMIRL02	NORTH OF JUPITER INLET IN	1991	2000	758
	3226B	MARTIN CO. ICW	ESTUARY	21FLSFWMIRL03	NORTH OF JUPITER INLET IN	1991	1999	714
	3226B	MARTIN CO. ICW	ESTUARY	21FLSFWMIRL04	MARTIN COUNTY IN ICWW	1991	2000	895
	3226B	MARTIN CO. ICW	ESTUARY	21FLSFWMIRL05	MARTIN COUNTY IN ICWW	1991	1999	868
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLA 27020464	ST LUCIE & INTRACOASTAL	1992	1992	25
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLA 28010042	SR 70 BRIDGE OVER TEN	1994	1995	11
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLA 28010168	IND RVR 1.9M NNE NW PT	1998	1998	6
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLA 28010174	WAVELAND MARINA,	1998	1998	6
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLINDRIR371	Mouth of Ft. Pierce Inlet (N&S	1996	1998	307
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLINDRIR372A	North of Fort Pierce East	1998	1998	34
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLINDRIR373	INDIAN R @Bear Point	1995	1998	90
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLINDRIR376	INDIAN R Jensen Bch W	1995	1998	428
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLINDRIR379	INDIAN R Jensen CSwy	1996	1996	45
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLINDRIR390	INDIAN RIVER	1992	1992	156
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLINDRIR405	INDIAN RIVER	1992	1993	162

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLINDRIR410	INDIAN RIVER	1991	1992	288
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLINDRMOEC	Ft. Pierce Util Manatee	1998	1998	234
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL16	SAILFISH POINT MARINA IN	1991	1999	860
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL17	MARTIN CNTY. IN ST. LUCIE	1991	2000	785
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL18	MARTIN CNTY. IN RIVER AT	1991	1999	510
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL19	MARTIN CNTY. IN RIVER AT	1991	1999	676
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL20	ST. LUCIE CNTY. IN	1991	1999	857
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL21	ST. LUCIE CNTY. IN ICWW	1991	2000	858
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL22	ST. LUCIE CNTY. IN ICWW A	1991	2000	627
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL24	ST. LUCIE CNTY. .5 MI. N. OF	1991	2000	601
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL25	ST LUCIE CNTY. IN ICWW	1991	2000	408
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL26	IN ICWW OPPOSITE POWER	1991	1999	616
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL27	ICWW NEAR CHANNEL	1991	2000	672
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL28	ICWW BETWEEN MARKERS	1991	2000	515
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL29	ICWW S. END OF	1991	2000	510
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL30	ICWW S. OF FT. PIERCE	1991	1999	829
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL31	ICWW S. OF FT. PIERCE	1991	2000	864
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL31B	OPEN WATER SITE FOR	2000	2000	23
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMIRL40	ICWW S. OF FT. PIERCE	1991	2000	591
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSFWMSE 00	MIDDLE OF ST. LUCIE INLET	1991	1994	2781
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSLMCWQ01TC	IMPDMNT 1-RIVER SHORE	1997	1997	40

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSLMCWQ02TC	IMPDMNT 2-RIVER SHORE	1997	1997	45
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLSLMCWQ08CTA	IMPDMNT 8C-PERIMTR DTCH	1997	1998	105
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLWPB 27020570	Indian River Lagoon Site L	2000	2000	8
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLWPB 27020571	Indian River Lagoon Site M	2000	2000	8
	5003A	SOUTH INDIAN RIVER	ESTUARY	21FLWPB 28010364	Indian River Lagoon Marker	2000	2000	29
	5003AB	STUART CAUSEWAY	COASTAL	21FLDOH MARTIN4	STUART CAUSEWAY	2000	2000	5
	5003AC	JENSEN BEACH CAUSEWAY	COASTAL	21FLA 27020546	INDIAN RIVER NEAR RAMP	1998	1998	16
	5003AC	JENSEN BEACH CAUSEWAY	COASTAL	21FLDOH MARTIN2	JENSEN BEACH CAUSEWAY	2000	2000	8
	8101	COASTAL OCEAN 1	COASTAL	21FLLOX B31	SANDBAR OFF NE TIP OF	1992	1998	162
	8101A	JUPITER BEACH PARK	COASTAL	21FLDOH PALM BEACH3	JUPITER BEACH PARK	2000	2000	11
	8101A	JUPITER BEACH PARK	COASTAL	21FLDOH VOLUSIA9	OCEANVIEW WAY	2000	2000	9
	8104	COASTAL OCEAN 4	COASTAL	1114PEST128066B	ATLANTIC OCEAN OFF FT.	1992	1992	12
	8104	COASTAL OCEAN 4	COASTAL	1114PEST128066D	ATLANTIC OCEAN OFF FT.	1992	1992	11
	8104	COASTAL OCEAN 4	COASTAL	1114PEST128066E	ATLANTIC OCEAN OFF FT.	1992	1992	11
	8104	COASTAL OCEAN 4	COASTAL	1114PEST128066H	ATLANTIC OCEAN OFF FT.	1992	1992	7
	8104	COASTAL OCEAN 4	COASTAL	1114PEST128066I	ATLANTIC OCEAN OFF FT.	1992	1992	11
	8104	COASTAL OCEAN 4	COASTAL	1114PEST128066J	ATLANTIC OCEAN OFF FT.	1992	1992	11
	8104	COASTAL OCEAN 4	COASTAL	1114PEST128066L	ATLANTIC OCEAN OFF FT.	1992	1992	10
	8104	COASTAL OCEAN 4	COASTAL	21FLINDRIR372	Ft. Pierce Yachting Ctr@Head	1995	1998	24
	8104	COASTAL OCEAN 4	COASTAL	21FLINDRIR374	INDIAN R@ Resdnce Dock in	1995	1996	221
	8104	COASTAL OCEAN 4	COASTAL	21FLSFWMKREA 94	MICCO BLUFF RUN	1996	2000	125

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
Loxahatchee	8104	COASTAL OCEAN 4	COASTAL	21FLSLMCWQ09TA	IMP 9, IN DITCH NEXT TO	1995	1998	260
	3224	JONATHAN DICKINSON	ESTUARY	21FLLOX 106	JD PARK KITCHEN CREEK AT	1995	1998	268
	3224	JONATHAN DICKINSON	ESTUARY	21FLLOX 107	RIVERS EDGE CULVERT	1994	1998	403
	3224	JONATHAN DICKINSON	ESTUARY	21FLLOX 62	NORTHWEST FORK UNDER	1991	1998	935
	3224	JONATHAN DICKINSON	ESTUARY	21FLLOX 63	NW FORK OFF OSPREY	1991	1998	792
	3224	JONATHAN DICKINSON	ESTUARY	21FLLOX 64	NW LOXAHATCHEE RIVER	1994	1998	607
	3224	JONATHAN DICKINSON	ESTUARY	21FLLOX 65	NW FORK 1/4 M UPSTREAM	1991	1998	750
	3224	JONATHAN DICKINSON	ESTUARY	21FLLOX 66	NW FORK AT HOBE GROVE	1991	1998	717
	3224	JONATHAN DICKINSON	ESTUARY	21FLLOX B62.5	NW FORK E TIP MANG ISLE	1992	1998	149
	3224	JONATHAN DICKINSON	ESTUARY	21FLPBCH1	NW FK LOXAHATCHEE R NR	1991	1992	93
	3224A	NORTH FORK LOXAHATCHEE	STREAM	21FLA 28010223	NORTH FK LOXAHATCHEE	1992	1998	1884
	3224A	NORTH FORK LOXAHATCHEE	STREAM	21FLA 28010321	N FK LOXAHATCHEE AT	1997	1997	11
	3224A	NORTH FORK LOXAHATCHEE	STREAM	21FLA 28010322	N FK LOXAHATCHEE RIVER	1997	1997	21
	3224A	NORTH FORK LOXAHATCHEE	STREAM	21FLA 28010323	N FK LOXAHATCHEE IN	1997	1997	10
	3224A	NORTH FORK LOXAHATCHEE	STREAM	21FLA 28010324	WEST BRANCH N FK	1997	1997	10
	3224A	NORTH FORK LOXAHATCHEE	STREAM	21FLA 28010325	EAST BRANCH N FK	1997	1997	10
	3224A	NORTH FORK LOXAHATCHEE	STREAM	21FLLOX 57	N FORK IN JD PARK OFF	1993	1998	482
	3224A	NORTH FORK LOXAHATCHEE	STREAM	21FLLOX 58	N FORK LOXAHATCHEE	1997	1998	110
	3224A	NORTH FORK LOXAHATCHEE	STREAM	21FLWPB 28010223	NORTH FK LOXAHATCHEE	1999	1999	3
	3224B	KITCHINGS CREEK	STREAM	21FLLOX 109	NORTH KITCHING CREEK	1998	1998	63

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3224C	CYPRESS CREEK	STREAM	21FLA 28010105	CYPRESS CR AT TURNPIKE	1995	1995	20
	3224C	CYPRESS CREEK	STREAM	21FLLOX 100	NW FORK AT CONFLUENCE	1992	1998	556
	3224C	CYPRESS CREEK	STREAM	21FLLOX 104	HOBE GROVE CANAL AT JD	1994	1998	286
	3224C	CYPRESS CREEK	STREAM	21FLLOX 105	CYPRESS CREEK GROVE	1991	1998	608
	3226A	NW FORK LOXAHATCHEE	ESTUARY	21FLLOX 60	NW FORK 1ST SANDBAR	1994	1998	630
	3226A	NW FORK LOXAHATCHEE	ESTUARY	21FLLOX B60	NW FORK 1ST SANDBAR	1992	1998	85
	3226C	SW FORK LOXAHATCHEE	ESTUARY	21FLLOX 71	SW FORK JONES CREEK	1991	1998	664
	3226C	SW FORK LOXAHATCHEE	ESTUARY	21FLLOX 72	LOX RIVER RD BRIDGE	1992	1998	712
	3226C	SW FORK LOXAHATCHEE	ESTUARY	21FLLOX 73	SW FORK SIMS CREEK	1991	1998	628
	3226C	SW FORK LOXAHATCHEE	ESTUARY	21FLLOX B70	SW FORK 500 YDS OFF	1992	1998	166
	3226C	SW FORK LOXAHATCHEE	ESTUARY	21FLPBCH3A	C-18 CANAL,	1991	1994	133
	3226D	LOXAHATCHEE RIVER	ESTUARY	21FLA 28010144	LOX RV .35 MI W ALT A1A	1992	1994	280
	3226D	LOXAHATCHEE RIVER	ESTUARY	21FLLOX 40	CENTRAL EMBAYMENT	1992	1998	566
	3226D	LOXAHATCHEE RIVER	ESTUARY	21FLLOX 41	CENTRAL EMBAY W OF	1992	1994	113
	3226D	LOXAHATCHEE RIVER	ESTUARY	21FLLOX 51	N FORK LOX RIVER UNDER	1991	1998	785
	3226D	LOXAHATCHEE RIVER	ESTUARY	21FLLOX 55	N FORK LOX RIVER UNDER	1991	1998	661
	3226D	LOXAHATCHEE RIVER	ESTUARY	21FLLOX B41	CENTRAL EMBAY W OF	1993	1998	54
	3226D	LOXAHATCHEE RIVER	ESTUARY	21FLPBCH2	LOXAHATCHEE R AT	1991	1992	94
	3230	FLOODPLN/JUPITER FARMS	STREAM	21FLA 28010079	LOX R AT SR 706. W OF	1997	1997	15
	3230	FLOODPLN/JUPITER FARMS	STREAM	21FLA 28010091	LOX R, CNL TO. W OF	1997	1997	15
	3230	FLOODPLN/JUPITER FARMS	STREAM	21FLA 28010224	NW FORK OF	1992	1998	225

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
North St. Lucie	3230	FLOODPLN/JUPITER FARMS	STREAM	21FLA 28010331	CANAL L4 WHICH DISCH TO	1997	1997	34
	3230	FLOODPLN/JUPITER FARMS	STREAM	21FLA 28010334	L2 CANAL WHICH DISCH TO	1997	1997	33
	3230	FLOODPLN/JUPITER FARMS	STREAM	21FLLOX 68	LOXAHATCHEE RIVER AT	1991	1998	642
	3230	FLOODPLN/JUPITER FARMS	STREAM	21FLLOX 69	LOXAHATCHEE RIVER AT	1991	1998	678
	3230	FLOODPLN/JUPITER FARMS	STREAM	21FLLOX 92	C14 DOWNSTREAM OF G92	1994	1998	471
	3230	FLOODPLN/JUPITER FARMS	STREAM	21FLLOX 95	1ST CANAL S OF ITR ON	1992	1998	612
	3230	FLOODPLN/JUPITER FARMS	STREAM	21FLPBCH7A	NW FORK CREEK AT	1991	1999	180
	3230	FLOODPLN/JUPITER FARMS	STREAM	21FLPBCH7B	JUPITER FARMS AND NO-1	1991	1999	171
	3230A	NW FORK LOXAHATCHEE	STREAM	21FLLOX 67	NORTHWEST FORK AT	1991	1998	636
	3234	C-18	STREAM	21FLA 28010089	C-18 CNL AT BEND TO NE. W	1997	1997	24
	3234	C-18	STREAM	21FLLOX 81	C18 CANAL AT INDIANTOWN	1991	1998	642
	3234	C-18	STREAM	21FLPBCH15	CANAL C-18 AT SR710	1991	2000	204
	3234	C-18	STREAM	21FLPBCH16	C-18 (HUNGERLAND	1991	2000	195
	3234	C-18	STREAM	21FLPBCH7	CANAL C-18 AT	1991	2000	200
	3234	C-18	STREAM	21FLSFWMC18G92	UPSTREAM OF G92 ON C-18	1991	2000	1625
	3234	C-18	STREAM	21FLSFWMC18S46	UPSTREAM OF S46 ON C-18	1991	2000	1922
	3234	C-18	STREAM	21FLSFWMC18SR710	AT THE POINT WHERE C-18	1991	1996	1349
	3234	C-18	STREAM	21FLWPB 28010135	C-18 CANAL AT SR 786	1999	2000	49
	3234	C-18	STREAM	21FLWPB 28010502	C18	1999	1999	29
	3194	NORTH ST. LUCIE	ESTUARY	21FLA 28010008	NO FORK ST LUCIE RIV	1995	1998	2

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3194	NORTH ST.LUCIE	ESTUARY	21FLA 28010009	NO FORK ST LUCIE RIV SR	1992	1998	660
	3194	NORTH ST.LUCIE	ESTUARY	21FLA 28010010	NO FORK ST LUCIE PRIMA	1992	1995	29
	3194	NORTH ST.LUCIE	ESTUARY	21FLA 28010035	NEAR MOUTH OF C-24	1992	1998	42
	3194	NORTH ST.LUCIE	ESTUARY	21FLA 28010310	N FK ST. LUCIE R SOUTH OF	1995	1996	77
	3194	NORTH ST.LUCIE	ESTUARY	21FLA 28010610	N. FORK ST. LUCIE	1992	1995	27
	3194	NORTH ST.LUCIE	ESTUARY	21FLA 28010612	NORTH FORK ST LUCIE N OF	1992	1995	24
	3194	NORTH ST.LUCIE	ESTUARY	21FLA 28010879	NORTH FORK ST LUCIE RIV	1992	1995	24
	3194	NORTH ST.LUCIE	ESTUARY	21FLSFWMSE 06	S.SIDE KELLSTADT BRIDGE	1991	2000	4138
	3194	NORTH ST.LUCIE	ESTUARY	21FLSFWMSE 07	DWN.STRM OF S49 ON C24	1991	2000	3468
	3194	NORTH ST.LUCIE	ESTUARY	21FLWPB 28010008	NO FORK ST LUCIE RIV	1999	1999	81
	3194	NORTH ST.LUCIE	ESTUARY	21FLWPB 28010009	NO FORK ST LUCIE RIV SR	1999	2000	285
	3194	NORTH ST.LUCIE	ESTUARY	21FLWPB 28010010	NO FORK ST LUCIE PRIMA	1999	1999	48
	3194	NORTH ST.LUCIE	ESTUARY	21FLWPB 28010879	NORTH FORK ST LUCIE RIV	1999	2000	62
	3194A	TENMILE CREEK	STREAM	21FLA 28010007	TEN MILE CREEK AT SELVITZ	1992	1994	26
	3194A	TENMILE CREEK	STREAM	21FLA 28010045	GORDY RD BRIGE OVER TEN	1992	1998	112
	3194A	TENMILE CREEK	STREAM	21FLA 28010122	TENMILE CREEK AT I-95	1998	1998	6
	3194A	TENMILE CREEK	STREAM	21FLA 28010232	TEN MILE CREEK 50 YDS	1994	1998	39
	3194A	TENMILE CREEK	STREAM	21FLWPB 28010007	TEN MILE CREEK AT SELVITZ	1999	1999	11
	3194A	TENMILE CREEK	STREAM	21FLWPB 28010045	GORDY RD BRIGE OVER TEN	1999	2000	65
	3194B	ST. LUCIE	ESTUARY	21FLA 28010014	ROOSEVELT BRIDGE PNS	1992	1998	760
	3194B	ST. LUCIE	ESTUARY	21FLA 28010016	CANAL C-23 AT BRIDGE	1992	1998	96

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3194B	ST. LUCIE	ESTUARY	21FLA 28010033	MOUTH OF WINTERS &	1992	1992	23
	3194B	ST. LUCIE	ESTUARY	21FLA 28010037	BETWEEN BESSY CR PT&	1992	1998	290
	3194B	ST. LUCIE	ESTUARY	21FLA 28010038	BETWEEN PENDARVIS PTS	1992	1997	129
	3194B	ST. LUCIE	ESTUARY	21FLA 28010039	DUE SOUTH OF GREENRIDGE	1992	1995	25
	3194B	ST. LUCIE	ESTUARY	21FLA 28010051	ST.LUCIE ESTUARY NEAR	1992	1992	31
	3194B	ST. LUCIE	ESTUARY	21FLA 28010214	ST.LUCIE ESTUARY NEAR	1992	1998	31
	3194B	ST. LUCIE	ESTUARY	21FLA 28010228	NO.FORK ST.LUCIE R.	1992	1992	23
	3194B	ST. LUCIE	ESTUARY	21FLA 28010230	N.FK.ST.LUCIE R. BTWN	1992	1992	23
	3194B	ST. LUCIE	ESTUARY	21FLA 28010231	N.FORK.ST.LUCIE R. BTWN	1992	1992	24
	3194B	ST. LUCIE	ESTUARY	21FLINDRSL02	INDIAN RIVER LAGOON-ST	1991	1992	185
	3194B	ST. LUCIE	ESTUARY	21FLSFWMHR1	HR1 N. FORK OF THE ST.	1994	2000	4243
	3194B	ST. LUCIE	ESTUARY	21FLSFWMHR1D-0.5	PRIMARY PRODUCTIVITY	1999	2000	5
	3194B	ST. LUCIE	ESTUARY	21FLSFWMHR1D-1.5	PRIMARY PRODUCTIVITY	1999	2000	5
	3194B	ST. LUCIE	ESTUARY	21FLSFWMHR1D-2.5	PRIMARY PRODUCTIVITY	1999	2000	5
	3194B	ST. LUCIE	ESTUARY	21FLSFWMHR1S	PRIMARY PRODUCTIVITY	1999	2000	5
	3194B	ST. LUCIE	ESTUARY	21FLSFWMSE 04	DWN.STRM. S48 ON C23	1991	2000	4221
	3194B	ST. LUCIE	ESTUARY	21FLSFWMSE 05	IN RIVER NEAR GUAGING	1991	1996	3115
	3194B	ST. LUCIE	ESTUARY	21FLWPB 28010214	ST.LUCIE ESTUARY NEAR	2000	2000	10
	3194B	ST. LUCIE	ESTUARY	21FLWPB 28010368	St . Lucie Estuary Marker 6A	2000	2000	24
	3194B	ST. LUCIE	ESTUARY	21FLWPB 28010453	St. Lucie Estuary @ Marker	1999	2000	47
	3194B	ST. LUCIE	ESTUARY	21FLWPB 28010454	St Lucie Estuary @ Marker 5	2000	2000	44

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3194B	ST. LUCIE	ESTUARY	21FLWPB 28010455	St Lucie Estuary @ Marker 3	2000	2000	31
	3194B	ST. LUCIE	ESTUARY	21FLWPB 28010473	Port St. Lucie Stormwater	1999	2000	171
	3194C	SAVANNAHS	LAKE	21FLA 28010107	SAVANNAHS AT WHITE	1995	1996	110
	3194C	SAVANNAHS	LAKE	21FLA 28010111	SAVANNAHS AT ANKONA	1993	1998	466
	3194C	SAVANNAHS	LAKE	21FLA 28010258	SAVANNAS STATE	1994	1996	93
	3194C	SAVANNAHS	LAKE	21FLA 28010259	HOWARD ST. CANAL IN	1994	1998	201
	3194C	SAVANNAHS	LAKE	21FLA 28010260	SAVANNAS PRESERVE	1994	1996	182
	3194C	SAVANNAHS	LAKE	21FLA 28010262	SE OF IMPACT ASSESSMENT	1994	1994	19
	3194C	SAVANNAHS	LAKE	21FLA 28010284	INDIAN RIVER ESTATES	1995	1998	165
	3194C	SAVANNAHS	LAKE	21FLA 28010285	INDIAN RIVER ESTATES	1995	1998	175
	3194C	SAVANNAHS	LAKE	21FLA 28010286	HOGPEN SLOUGH DISCH TO	1995	1997	88
	3194C	SAVANNAHS	LAKE	21FLA 28010287	SAVANNAS DISCHARGE	1995	1996	62
	3194C	SAVANNAHS	LAKE	21FLA 28010289	SAVANNA STATE RESERVE	1995	1998	203
	3194C	SAVANNAHS	LAKE	21FLA 28010290	SAVANNA RESERVE S OF	1995	1996	135
	3194C	SAVANNAHS	LAKE	21FLA 28010291	SAVANNA RESERVE NEAR	1995	1996	135
	3194C	SAVANNAHS	LAKE	21FLA 28010292	SAVANNA RESERVE NEAR	1995	1998	198
	3194C	SAVANNAHS	LAKE	21FLA 28010293	SAVANNA RESERVE AT	1995	1996	130
	3194C	SAVANNAHS	LAKE	21FLA 28010294	SAVANNA RESERVE AT	1995	1996	111
	3194C	SAVANNAHS	LAKE	21FLA 28010295	SAVANNA RESERVE S OF	1995	1996	112
	3194C	SAVANNAHS	LAKE	21FLA 28010296	SAVANNA RESERVE	1995	1998	199
	3194C	SAVANNAHS	LAKE	21FLA 28010297	SAVANNA RESERVE N OF	1995	1996	111

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3194C	SAVANNAHS	LAKE	21FLA 28010298	SAVANNA RESERVE AT	1995	1996	123
	3194C	SAVANNAHS	LAKE	21FLA 28010299	SAVANNA RESERVE AT	1995	1996	111
	3194C	SAVANNAHS	LAKE	21FLA 28010300	SAVANNA RESERVE S OF	1995	1996	105
	3194C	SAVANNAHS	LAKE	21FLA 28010301	SAVANNA RESERVE NEAR	1995	1996	105
	3194C	SAVANNAHS	LAKE	21FLA 28010302	SAVANNA RESERVE OFF	1995	1998	194
	3194C	SAVANNAHS	LAKE	21FLA 28010303	SAVANNA RESERVE AT	1995	1996	126
	3194C	SAVANNAHS	LAKE	21FLA 28010304	SAVANNA RESERVE W OF	1995	1996	112
	3194C	SAVANNAHS	LAKE	21FLA 28010305	SAVANNA RESERVE AT SW	1995	1996	125
	3194C	SAVANNAHS	LAKE	21FLA 28010312	SAVANNAS DISCH DITCH AT	1996	1996	25
	3194C	SAVANNAHS	LAKE	21FLA 28010339	STREAM OVER SAVANNAS	1998	1998	22
	3194C	SAVANNAHS	LAKE	21FLWPB 28010111	SAVANNAHS AT ANKONA	1999	2000	69
	3194C	SAVANNAHS	LAKE	21FLWPB 28010258	SAVANNAS STATE	2000	2000	27
	3194C	SAVANNAHS	LAKE	21FLWPB 28010259	HOWARD ST. CANAL IN	1999	1999	10
	3194C	SAVANNAHS	LAKE	21FLWPB 28010285	INDIAN RIVER ESTATES	1999	1999	11
	3194C	SAVANNAHS	LAKE	21FLWPB 28010286	HOGPEN SLOUGH DISCH TO	1999	1999	11
	3194C	SAVANNAHS	LAKE	21FLWPB 28010339	STREAM OVER SAVANNAS	1999	1999	10
	3194D	FIVEMILE CREEK	STREAM	21FLA 28010133	FIVE MILE CR AT RR	1992	1992	26
	3194D	FIVEMILE CREEK	STREAM	21FLWPB 28010001	FIVE MILE CRK OKEECHOBEE	1999	2000	138
Okeechobee Waterway (C-44)								
	3218	C-44	STREAM	21FLA 28010017	ST LUCIE CANAL AT ST	1992	1998	92
	3218	C-44	STREAM	21FLA 28010027	SR76A BRIDGE OVER ST	1992	1992	26

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
South St. Lucie -IRL	3218	C-44	STREAM	21FLSFWMC44S80	UPSTREAM OF S80 ON C-44	1991	2000	2305
	3218	C-44	STREAM	21FLSFWMS80	S-80 SPILLWAY AND LOCK	1991	2000	213
	3210	TIDAL ST. LUCIE	ESTUARY	21FLA 28010015	SO FORK ST LUCIE AT PALM	1992	1992	25
	3210	TIDAL ST. LUCIE	ESTUARY	21FLA 28010030	POPPOLTON CREEK AT SR	1992	1992	13
	3210	TIDAL ST. LUCIE	ESTUARY	21FLA 28010075	FRAZER CRK AT US#1	1992	1992	25
	3210	TIDAL ST. LUCIE	ESTUARY	21FLA 28010084	SOUTH FORK ST. LUCIE	1992	1992	25
	3210	TIDAL ST. LUCIE	ESTUARY	21FLA 28010229	ST. LUCIE R. MIDCHNL BTWN	1992	1998	284
	3210	TIDAL ST. LUCIE	ESTUARY	21FLA 28010326	S ST. LUCIE ESTUARY AT	1997	1997	28
	3210	TIDAL ST. LUCIE	ESTUARY	21FLINDRSL01	INDIAN RIVER LAGOON-ST	1991	1993	222
	3210	TIDAL ST. LUCIE	ESTUARY	21FLINDRSL010	S Fork of St Lucie R 1/2 mi S	1995	1996	95
	3210	TIDAL ST. LUCIE	ESTUARY	21FLSFWMSE 03	WEST SIDE OF ROSEVELT	1991	2000	5568
	3210	TIDAL ST. LUCIE	ESTUARY	21FLSFWMSE 08	S. SIDE PALM BAY BRIDGE	1991	2000	1891
	3210	TIDAL ST. LUCIE	ESTUARY	21FLSFWMSFD-0.5	PRIMARY PRODUCTIVITY	2000	2000	3
	3210	TIDAL ST. LUCIE	ESTUARY	21FLSFWMSFD-1.0	PRIMARY PRODUCTIVITY	2000	2000	3
	3210	TIDAL ST. LUCIE	ESTUARY	21FLSFWMSFD-1.5	PRIMARY PRODUCTIVITY	2000	2000	3
	3210	TIDAL ST. LUCIE	ESTUARY	21FLWPB 28010461	St Lucie Estuary @ Marker	2000	2000	11
	3210A	ST. LUCIE CANAL	ESTUARY	21FLA 28010028	ST LUCIE CAN AT NAVAG	1992	1992	16
	3210A	ST. LUCIE CANAL	ESTUARY	21FLA 28010222	MARINA NR TRNPK ON ST.	1992	1992	16
	3210A	ST. LUCIE CANAL	ESTUARY	21FLA 28010344	ST LUCIE CANAL AT I95	1998	1998	16
	3210A	ST. LUCIE CANAL	ESTUARY	21FLA 28010345	ST LUCIE CANAL	1998	1998	16

Table E1 (continued)

Planning Unit	WBID	Waterbody Segment	Type	Storet Station ID	Station Description	BD	ED	# of Obs.
	3210A	ST. LUCIE CANAL	ESTUARY	21FLA 28010609	ST LUCIE CANAL AT SOUTH	1992	1998	40
	3210A	ST. LUCIE CANAL	ESTUARY	21FLSFWMSE 10	DWN STRM. ST LUCIE LOCK	1991	2000	4028
	3210A	ST. LUCIE CANAL	ESTUARY	21FLWPB 28010222	MARINA NR TRNPK ON ST.	2000	2000	10
	3210A	ST. LUCIE CANAL	ESTUARY	21FLWPB 28010344	ST LUCIE CANAL AT I95	2000	2000	33
	3210A	ST. LUCIE CANAL	ESTUARY	21FLWPB 28010345	ST LUCIE CANAL	2000	2000	13
	3210B	SOUTH FORK ST. LUCIE	STREAM	21FLA 28010018	SO FORK ST LUCIE AT SR76	1992	1992	25
	3210B	SOUTH FORK ST. LUCIE	STREAM	21FLA 28010238	S FK ST LUCIE R NW HOBE	1994	1994	39
	3210B	SOUTH FORK ST. LUCIE	STREAM	21FLA 28010239	S FK ST LUCIE R NW HOBE	1994	1998	160
	3210B	SOUTH FORK ST. LUCIE	STREAM	21FLA 28010608	SOUTH FORK ST LUCIE RIV	1992	1998	1682
	3210B	SOUTH FORK ST. LUCIE	STREAM	21FLSFWMSE 09	S. FORK ST LICIE LOCK S-80	1991	2000	4069
	3210B	SOUTH FORK ST. LUCIE	STREAM	21FLWPB 28010239	S FK ST LUCIE R NW HOBE	1999	1999	12
	3210B	SOUTH FORK ST. LUCIE	STREAM	21FLWPB 28010478	South fork St . Lucie River @	2000	2000	7
	3210B	SOUTH FORK ST. LUCIE	STREAM	21FLWPB 28010523	SFORK/CANAL	1999	1999	3
	3210B	SOUTH FORK ST. LUCIE	STREAM	21FLWPB 28010608	SOUTH FORK ST LUCIE RIV	1999	2000	135
	3211	BESSEY CREEK	ESTUARY	21FLA 28010031	ST LUCIE RIV AT MOUTH OF	1992	1992	189
	3211	BESSEY CREEK	ESTUARY	21FLA 28010047	BESSEY CRK AT MURPHY	1992	1992	192
	3211	BESSEY CREEK	ESTUARY	21FLA 28010098	AT SPILLWAY IN C23	1992	1992	52
	3211	BESSEY CREEK	ESTUARY	21FLA 28010176	MOUTH OF BESSEY CRK	1992	1992	209
	3211	BESSEY CREEK	ESTUARY	21FLA 28010213	BESSEY CREEK AT END OF	1992	1992	42
	3211	BESSEY CREEK	ESTUARY	21FLA 28010959	BESSEY CREEK AT BESSEY	1998	1998	11
	3220	BASIN 2	STREAM	21FLA 28010320	N FK LOX AT BRIDGE ROAD	1997	1997	22

Appendix F: Level 1 Land Use by Planning Unit for the St. Lucie and Loxahatchee Basin Group

Table F: Land Use in the St. Lucie and Loxahatchee Basins

Planning Unit ----->	C-23		C-24		C-25		C-44	
Land Use Category	Area (square miles)	Percentage of Land Area	Area (square miles)	Percentage of Land Area	Area (square miles)	Percentage of Land Area	Area (square miles)	Percentage of Land Area
Urban And Built-Up	3.40	2.04	18.24	10.70	9.92	4.80	3.10	1.63
Agriculture	106.86	64.13	103.76	60.90	134.67	65.08	119.78	63.15
Rangeland	0.61	0.37	1.28	0.75	1.47	0.71	1.81	0.95
Upland Forests	11.44	6.87	14.51	8.52	33.94	16.40	11.62	6.12
Water	1.58	0.95	2.38	1.40	1.58	0.76	11.59	6.11
Wetlands	39.84	23.91	28.45	16.70	21.29	10.29	39.97	21.07
Barren Land	1.37	0.82	0.51	0.30	0.67	0.32	0.31	0.16
Transportation, Communications And Utilities	1.53	0.92	1.24	0.73	3.39	1.64	1.50	0.79
Totals	166.64	100.00	170.36	100.00	206.93	100.00	189.66	100.00
Planning Unit ----->	Coastal		Loxahatchee		North St. Lucie		South St. Lucie IRL	
Land Use Category	Area (square miles)	Percentage of Land Area	Area (square miles)	Percentage of Land Area	Area (square miles)	Percentage of Land Area	Area (square miles)	Percentage of Land Area
Urban And Built-Up	28.94	26.02	47.34	20.97	66.64	35.26	27.53	26.31
Agriculture	0.88	0.79	32.21	14.27	65.98	34.91	33.41	31.93
Rangeland	0.13	0.12	1.03	0.46	0.90	0.47	2.20	2.11
Upland Forests	9.91	8.91	11.53	5.11	21.71	11.49	24.65	23.56
Water	55.14	49.58	2.14	0.95	2.41	1.27	2.51	2.40
Wetlands	14.17	12.74	128.93	57.11	26.35	13.94	10.31	9.85
Barren Land	0.57	0.51	0.52	0.23	0.78	0.41	1.58	1.51
Transportation, Communications And Utilities	1.47	1.32	2.03	0.90	4.23	2.24	2.44	2.33
Totals	111.20	100.00	225.74	100.00	188.99	100.00	104.64	100.00







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